19344

Sam.l Lewis M.D.

COLL... OF PHILADELPH...

TRANSACTIONS

OF THE

PATHOLOGICAL SOCIETY

OF PHILADELPHIA.

VOLUME NINTH.

CONTAINING THE REPORT OF THE PROCEEDINGS FROM SEPTEMBER, 1878, TO JULY, 1879.

EDITED BY

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LECTURER ON HISTOLOGY IN THE UNIVERSITY OF PENNSYLVANIA; RECORDER OF THE SOCIETY.

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Former Presidents.

SAMUEL D. GROSS, M.D., LL.D. Oxon., elected 1857.
RENÉ LA ROCHE, M.D., elected 1858.
ALFRED STILLÉ, M.D., elected 1859, '61, '62 and '63.
EDWARD HARTSHORNE, M.D., elected 1863.
J. M. DA COSTA, M.D., elected 1864, '65 and '66.
JOHN H. PACKARD, M.D., elected 1867 and '68.
S. WEIR MITCHELL, M.D., elected 1869.
JOHN ASHHURST, Jr., M.D., elected 1870.
JAMES H. HUTCHINSON, M.D., elected 1871 and '72.
WILLIAM PEPPER, M.D., elected 1873.
H. LENOX HODGE, M.D., elected 1876.
S. W. GROSS, M.D., elected 1879.

OFFICERS AND COMMITTEES

OF THE

Pathological Society of Philadelphia.

President.

S. W. GROSS, M.D.

ELECTED OCTOBER, 1879, FOR THREE YEARS.

ELECTED AT THE ANNUAL MEETING, OCTOBER, 1879.

Vice-Presidents.

W. F. NORRIS, M.D.,
JAMES TYSON, M.D.,
J. E. MEARS, M.D.,
J. SOLIS COHEN, M.D.

Secretary.

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Recorder.

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Curator.

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FRED. P. HENRY, M.D. (ex officio).

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J. H. BRINTON, M.D., S. ASHHURST, M.D.,
J. H. C. SIMES, M.D. (ex officio).

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E. O. SHAKESPEARE, M.D., MORRIS LONGSTRETH, M.D.,
JOHN GUITÉRAS, M.D., CARL SEILER, M.D.,
H. F. FORMAD, M.D.

LIST OF MEMBERS.

Members marked N. R. are non-resident.
Members marked O. M. are of those originating the Society.

Elected

1857 Agnew, D. Hayes, Professor of Surgery in the University of Pennsylvania, 1611 Chestnut Street. (O. M.)
1871 Alison, Robert H., 250 South Seventeenth Street, one of the Physicians to the Hospital for Nervous Diseases.
1864 Allen, Harrison, resigned December 11th, 1879.
1869 Allis, Oscar H., one of the Surgeons to the Presbyterian Hospital, 1604 Spruce Street.
1865 Andrews, Thomas H., 1117 Spruce Street.
1871 Ashbridge, William, resigned December 11th, 1879.
1867 Ashhurst, Francis, Mount Holly, N. J. (N. R.)
1861 Ashhurst, John, Jr., Professor of Clinical Surgery in the University of Pennsylvania, 2000 West De Lancey Place.
1863 Ashhurst, Samuel, 1423 Walnut Street.
1871 Atlee, Washington L., Jr.*

1866 Bache, T. Hewson, 233 South Thirteenth Street.
1878 Baer, B. F., 218 South Twentieth Street.
1876 Barr, J. W., 804 South Tenth Street.
1880 Bartholow, Roberts, Professor of Materia Medica in the Jefferson Medical College, 1509 Walnut Street.
1867 Bartles, William H., Insane Department Pennsylvania Hospital, West Philadelphia. (N. R.)
1869 Barton, J. M., 1344 Spruce Street.
1873 Beecher, A. C. W., 1222 Walnut Street.
1870 Bell, J. R. F.*
1871 Bennett, Wm. H., 332 South Fifteenth Street.
1863 Benton, C. H. (N. R.)
1875 Bernardy, Eugene P., 221 South Seventeenth Street.
1870 Bertolet, Robert Morris. (N. R.)
1871 Betts, Thomas, Branchtown, Pa. (N. R.)
1860 Bishop, C. S., died.
1866 Black, J. J., New Castle, Delaware. (N. R.)

Elected

1863 Boardman, C. H., St. Paul, Minnesota. (N. R.)
1880 Boenning, Henry E., 1632 Chestnut Street.
1857 Boker, Charles S., one of the Surgeons to St. Joseph's Hospital, 1622 Chestnut Street. (O. M.)
1868 Bolles, Lucius S., died August 15th, 1873.
1877 Bradford, T. Hewson, 1905 Pine Street.
1873 Bray, Daniel, 1619 Vine Street.
1876 Brewster, W. B.*
1857 Brinton, John H., one of the Surgeons to the Philadelphia Hospital, 1423 Spruce Street. (O. M.)
1874 Brubaker, A. P., 217 North Thirteenth Street.
1874 Bruen, Edward T., one of the Visiting Physicians to the Philadelphia Hospital, 1531 Chestnut Street.
1871 Buck, William Penn, resigned October 23d, 1873.
1867 Burnett, C. H., Aural Surgeon to the Presbyterian Hospital, 127 South Eighteenth Street.

1872 Cathcart, James H., died March 5th, 1874.
1879 Cathcart, T. H., Resident Physician Episcopal Hospital.
1871 Cheston, C. Morris, West River, Maryland. (N. R.)
1865 Cheston, D. Murray, one of the Physicians to the Children's Hospital, 1839 Chestnut Street.
1871 Clark, Leonardo S., 1505 Girard Avenue.
1866 Cleemann, Richard A., one of the Physicians to St. Mary's Hospital, 340 South Twenty-first Street.
1872 Cohen, J. Solis, Lecturer on Laryngoscopy and Diseases of the Throat and Chest in the Jefferson Medical College, 1431 Walnut Street.
1877 Collins, James, 538 Marshall Street.
1869 Corbit, William B., Washington, D. C. (N. R.)
1877 Cruice, R. B., 731 North Seventeenth Street.
1871 Curtin, Roland G., Lecturer on Physical Diagnosis in the University of Pennsylvania, 332 South Seventeenth Street.

1857 Da Costa, J. M., Professor of Theory and Practice of Medicine in the Jefferson Medical College, 1700 Walnut Street. (O. M.)
1859 Darby, John T., New York City. (N. R.)
1876 Darlington, W. L., 146 North Twentieth Street.
1857 Darrach, James, 5094 Green Street, Germantown. (O. M.)
1868 Darrach, William, 42 Queen Street, Germantown.
1870 Deal, Lemuel J.*
1877 Deaver, R. W., 5075 Main Street, above High, Germantown.
1877 Drysdale, T. M., northeast corner Sixteenth and Arch Streets.
1866 Duer, Edward L., one of the Obstetricians to the Philadelphia Hospital, 1704 Arch Street.

Elected

1870 Duhring, L. A., Clinical Professor of Dermatology in the University of Pennsylvania, 1416 Spruce Street.
1876 Dulles, C. W., 220 South Fortieth Street.
1860 Dunton, W. R., 5059 Germantown Avenue, Germantown.
1863 Dyer, Ezra, Pittsburg, Pennsylvania. (N. R.)

1875 Engel, Hugo, northeast corner Fifth and Wood Streets.
1876 Eskridge, J. T., 1614 North Sixteenth Street.

1857 Fischer, Emil, southeast corner Sixth and Brown Streets. (O. M.)
1863 Fish, Augustine H., died August 3d, 1872.
1876 Fisher, Henry, 919 Walnut Street.
1857 Forbes, William S., one of the Surgeons to the Episcopal Hospital, 1405 Locust Street. (O. M.)
1869 Ford, William H., 1622 Summer Street.
1878 Formad, H. F., 105 South Thirty-fourth Street.
1871 Fox, Charles, resigned December 10th, 1874.

1868 Garretson, James E., 1537 Chestnut Street.
1871 Gerhard, George S., Ardmore. (N. R.)
1870 Getchell, Frank H., Clinical Lecturer on Diseases of Women in the Jefferson Medical College, 1432 Spruce Street.
1877 Gilliard, Louis, died Nov. 1878.
1877 Goldsborough, C. B. (N. R.)
1866 Goodell, William, Clinical Professor of Diseases of Women in the University of Pennsylvania, Preston Retreat, Twentieth and Hamilton Streets.
1868 Goodman, H. Earnest, one of the Surgeons to the Orthopædic Hospital, 1427 Chestnut Street.
1876 Gorgas, S. R.*
1868 Graham, James, resigned January 9th, 1879.
1867 Grier, Matthew J., 1531 Spruce Street.
1868 Gross, Ferdinand H., one of the Surgeons to the German Hospital, 608 North Sixth Street.
1857 Gross, Samuel D., Professor of Surgery in the Jefferson Medical College, southeast corner of Eleventh and Walnut Streets. (O. M.)
1858 Gross, Samuel W., one of the Visiting Surgeons to the Philadelphia Hospital, 1112 Walnut Street.
1869 Grove, John H., one of the Surgeons to St. Mary's Hospital, 1330 Arch Street.
1872 Gruel, Theodore H. E., 612 Spruce Street.
1874 Guitéras, John. (N. R.)

1871 Hale, George J.*
1857 Hall, A. Douglass, resigned October 9th, 1873. (O. M.)

Elected

1875 Hand, Frank C., 830 Pine Street.
1866 Hare, Horace Binney, died March 21st, 1879.
1868 Hargadine, R. W. (N. R.)
1859 Harlan, George C., one of the Surgeons to Wills Ophthalmic Hospital, 1806 Chestnut Street.
1874 Harris, Charles M., 715 South Twenty-third Street.
1858 Harris, Robert P., resigned January 9th, 1873.
1857 Hartshorne, Edward, 331 South Broad Street. (O. M.)
1859 Hartshorne, Henry, resigned October 12th, 1864.
1867 Hassler, Ferdinand A., resigned February 9th, 1871.
1869 Hatfield, Nathan L., one of the Visiting Surgeons to the Philadelphia Hospital, 501 Franklin Street.
1868 Hayes, I. Minis, 1607 Locust Street.
1879 Hazlehurst, S. F., one of the Assistant Physicians to the Children's Hospital, 1808 Pine Street.
1873 Hearn, Joseph, 324 Catharine Street.
1870 Henry, Frederick P., one of the Physicians to the Episcopal Hospital, 721 Pine Street.
1866 Herbert, Theodore. (N. R.)
1879 Hess, Robert, 610 Fairmount Avenue.
1857 Hewson, Addinell, southwest corner of Twenty-first and Walnut Streets. (O. M.)
1874 Hickman, N. B., 326 South Sixteenth Street.
1858 Hodge, H. Lenox, one of the Surgeons to the Presbyterian Hospital, 506 South Broad Street.
1871 Hoffman, Washington Atlee, died September 20th, 1874.
1860 Hopkins, Henry St. George. (N. R.)
1876 Hopkins, W. B., 2018 Spruce Street.
1877 Horwitz, Theodore, died December 12th, 1877.
1870 Houston, James P. S., Savannah, Georgia. (N. R.)
1866 Howe, Herbert M., resigned February 28th, 1878.
1859 Hoyt, William D. (N. R.)
1879 Hughes, Daniel E., 813 North Tenth Street.
1879 Huidekoper, R. S., 111 South Twentieth Street.
1857 Humphries, George H., New York City. (O. M., N. R.)
1868 Hunter, Charles T., Demonstrator of Surgery in the University of Pennsylvania, 1905 Walnut Street, one of the Surgeons to the Episcopal Hospital.
1870 Hutchins, E. R. (N. R.)
1858 Hutchinson, James H., one of the Physicians to the Pennsylvania Hospital, 2019 Walnut Street.
1866 Ingham, James V., resigned December 11th, 1879.
1876 Ingram, T. D., 1601 Vine Street.
1874 Jameson, Edward, St. Louis, Mo. (N. R.)

*

Elected

1866 Jenks, William F., Surgeon to the State Hospital for Women. (N.R.)
1875 Johnson, Russell H., one of the Assistant Physicians to the Children's Hospital, 2127 Spruce Street.

1859 Kane, John K., Wilmington, Delaware. (N. R.)
1874 Keating, John M., one of the Visiting Physicians to the Philadelphia Hospital, northwest corner Twenty-second and Locust Streets.
1857 Keating, William V. (O. M.*)
1866 Keen, William W., Professor of Artistic Anatomy, Pennsylvania Academy of Fine Arts, 1729 Chestnut Street.
1857 Keller, William, resigned January 28th, 1875. (O. M.)
1875 Kelly, Joseph V., 4257 Main Street, Manayunk.
1858 King, William, died.
1879 Kirkbride, J. J., 35 South Nineteenth Street.
1869 Knight, Samuel R., Superintendent of the Episcopal Hospital.

1867 Lambdin, Alfred C.*
1871 Landis, Henry G., Niles, Ohio. (N. R.)
1872 La Roche, C. Percy, Nice, France. (N. R.)
1857 La Roche, René. (O. M.) Died December 9th, 1872.
1870 Leach, Alonzo L., 2118 Spruce Street.
1869 Leaman, Henry, 1031 Vine Street.
1860 Lee, Charles C., New York City. (N. R.)
1861 Leedom, John M., Pulaski Avenue, Germantown.
1857 Levick, James J., resigned October 13th, 1861. (O. M.)
1857 Levis, Samuel, 1330 Spruce Street. (O. M.)
1868 Lewis, Francis W., 2016 Spruce Street.
1869 Lewis, Fred. W., died 1873.
1875 Lewis, Morris J., one of the Physicians to the Episcopal Hospital, 1216 Walnut Street.
1877 Little, William S., 219 South Seventeenth Street.
1859 Livezy, Edward,* died 1876.
1876 Loder, P. E., 517 South Eighth Street.
1873 Longenecker, Jerome.*
1870 Longstreth, Morris, one of the Physicians to the Pennsylvania Hospital, 333 South Twelfth Street.
1870 Loughlin, J. Eneu.*

1874 Mann, Charles H. (N. R.)
1867 Markoe, James.*
1868 Martin, George. (N. R.)
1874 Matteson, Charles C., died.
1865 Maury, Frank F., died 1879.
1870 Maxwell, J. Gordon,* died.

Elected

1866 McArthur, John A., 406 South Broad Street.
1861 McCall, C. A., resigned.
1868 McClure, W. Wallace, resigned September 10th, 1878.
1873 McCoy, A. W., Pittsburg, Pa. (N. R.)
1864 Mears, J. Ewing, one of the Surgeons to St. Mary's Hospital, 1429 Walnut Street.
1873 Meigs, Arthur V., one of the Assistant Physicians to the Children's Hospital, 1322 Walnut Street.
1857 Meigs, John Forsyth, one of the Physicians to the Pennsylvania Hospital, 1208 Walnut Street. (O. M.)
1874 Miller, C. K. I., resigned December 28th, 1876, died 1878.
1878 Mills, C. K., 1502 Columbia Avenue.
1857 Mitchell, S. Weir, one of the Physicians to the Hospital for Nervous Diseases, 1524 Walnut Street. (O. M.)
1876 Montgomery, E. C., southeast corner Twentieth and Jefferson Streets.
1857 Morehouse, George R., 227 South Ninth Street.
1857 Morton, Thomas George. (O. M.*)
1859 Moss, William, Chestnut Avenue, Chestnut Hill.
1871 Muhlenberg, Frank, 1911 Chestnut Street.
1869 Müller, August F., 4544 Germantown Avenue.
1880 Musser, John H., 3711 Lancaster Avenue.
1873 Musser, Milton B., Fortieth and Locust Streets.
1869 Mustin, J. Burton, died 1871.

1869 Nancrede, Charles B., one of the Surgeons to the Episcopal Hospital, 2109 Pine Street.
1879 Neff, J. S., 214 South Fifteenth Street.
1872 Newsham, Stanley P., 1507 South Fifth Street.
1868 Norris, Herbert, resigned January 8th, 1880.
1868 Norris, Isaac, resigned November 12th, 1874.
1869 Norris, J. C., resigned February 10th, 1876.
1861 Norris, William F., Clinical Professor of Ophthalmology in the University of Pennsylvania, 1526 Locust Street.

1875 O'Hara, Michael, 31 South Sixteenth Street.
1874 Osgood, Hamilton. (N. R.)

1857 Packard, John H., one of the Surgeons to the Episcopal Hospital, 1928 Spruce Street. (O. M.)
1868 Pancoast, William H., Professor of Anatomy in the Jefferson Medical College, 1100 Walnut Street.
1873 Parish, William H., 324 South Seventeenth Street.
1875 Parks, Edward L. (N. R.)
1867 Parry, John S., died 1876.

Elected

1870 Paul, Comegys, Resident Physician Eastern Penitentiary.
1875 Paul, James, resigned January 22, 1880.
1857 Penrose, R. A. F. (O. M.*)
1865 Pepper, George, died September 14th, 1872.
1865 Pepper, William, Professor of Clinical Medicine in the University of Pennsylvania, 1811 Spruce Street.
1879 Perkins, F. M., 1428 Pine Street.
1870 Porter, William G., Jr., one of the Surgeons to the Presbyterian Hospital, 314 South Eleventh Street.

1878 Raub, J. A., 927 North Tenth Street.
1874 Reed, Henry B., one of the Assistant Surgeons to the Episcopal Hospital, Northeast corner Thirty-ninth and Walnut Streets.
1859 Reed, Thomas B., one of the Surgeons to the Presbyterian Hospital, 1427 Walnut Street.
1871 Rex, George A., 2118 Pine Street.
1869 Rex, Oliver P.*
1877 Reynolds, A. S., 1801 Poplar Street.
1864 Rhoads, Edward, died January 16th, 1871.
1878 Rich, T. C., 622 South Sixteenth Street.
1869 Richardson, Elliott, Lecturer on Practical Obstetrics in the University of Pennsylvania, 737 Spruce Street.
1863 Richardson, Joseph G., one of the Visiting Physicians to the Presbyterian Hospital, 1835 Chestnut Street.
1857 Richardson, T. G., New Orleans, La. (O. M., N. R.)
1876 Risley, S. D., Lecturer on Ophthalmoscopy in the University of Pennsylvania, 1630 Walnut Street.
1868 Ritz, Charles M. (N. R.)
1876 Roberts, J. B., 1118 Arch Street.
1876 Roland, O. (N. R.)
1874 Ronaldson, William D., 4017 Locust Street.
1877 Rudderow, B. J., 527 North Nineteenth Street.

1867 Santee, Eugene J., 532 North Sixth Street.
1863 Savery, William, resigned February 11th, 1869.
1869 Schell, H. S., 1804 Chestnut Street.
1874 Seiler, Carl, 1608 Pine Street.
1870 Seyfert, Theodore H., resigned December 27th, 1877.
1870 Shaffner, Charles, 23 South Sixteenth Street.
1876 Shakespeare, E. O., Lecturer on Refraction and Accommodation and Operative Ophthalmic Surgery in the University of Pennsylvania, 1336 Spruce Street.
1869 Shapleigh, Elisha B., 658 North Eighth Street.
1868 Sherwood, Thomas H.*
1878 Shoemaker, J. V., 1031 Walnut Street.

Elected

1871 Simes, J. H. C., Lecturer on Histology in the University of Pennsylvania, 2033 Chestnut Street.

1868 Sinkler, Wharton, one of the Physicians to the Hospital for Nervous Diseases, 1534 Pine Street.

1858 Smith, A. H., Lecturer on Obstetrics at the Philadelphia Lying-in Charity, 1419 Walnut Street.

1863 Smith, E. A., 126 South Eighteenth Street.

1859 Smith, F. G., resigned November 13th, 1873. Died 1878.

1876 Smith, R. M., 25 South Sixteenth Street.

1875 Smith, Stanley. (N. R.)

1876 Smyth, F. G., died 1879.

1871 Sparks, George W.*

1866 Spooner, Edward A.*

1871 Starr, Louis, one of the Physicians to the Episcopal Hospital, 1417 Spruce Street.

1857 Stillé, Alfred, Professor of Theory and Practice of Medicine in the University of Pennsylvania, 3900 Spruce Street. (O. M.)

1870 Strawbridge, George, resigned June 10th, 1875.

1869 Stryker, Samuel S., one of the Obstetricians to the Philadelphia Hospital, 3713 Walnut Street.

1879 Taylor, J. M., northwest corner Twenty-second Street and St. Alban's Place.

1866 Thomas, Charles H., 1807 Chestnut Street.

1868 Thomson, William, one of the Surgeons to Wills Ophthalmic Hospital, 1502 Locust Street.

1870 Tinkham, J. H., United States Navy. (N. R.)

1866 Townsend, George D. (N. R.)

1868 Townsend, R. M., died.

1864 Turner, A. P. (N. R.)

1863 Tutt, Charles Pendleton, died May 11th, 1866.

1863 Tyson, James, Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, 1506 Spruce Street.

1871 Valdivieso, R. (N. R.)

1870 Van Harlingen, Arthur, Chief of the Dispensary for Diseases of the Skin, Hospital of the University of Pennsylvania, 129 South Fifteenth Street.

1879 Van Valzah, W. W., 1704 Arch Street.

1874 Warder, Wm. H., one of the Obstetricians to the Philadelphia Hospital, 810 North Broad Street.

1867 Watson, E. W., 146 North Twentieth Street.

1866 Weightman, John F., resigned April 27th, 1871.

Elected

1876 Weir, A. H., 130 South Fifteenth Street.
1875 West, Franklin, died.
1875 Whelen, Alfred, Senior Assistant Physician to the Philadelphia Lying-in Charity, 123 South Twentieth Street.
1873 White, J. William, one of the Visiting Surgeons to the Philadelphia Hospital, 222 South Sixteenth Street.
1868 Willard, De Forrest, Lecturer on Orthopædic Surgery in the University of Pennsylvania, 1626 Chestnut Street.
1865 Williams, Horace, resigned December 11th, 1879.
1875 Williamson, Jesse, one of the Surgeons to Howard Hospital, 1711 Pine Street.
1867 Wilson, Ellwood, resigned.
1869 Wilson, James C., one of the Visiting Physicians to the Philadelphia Hospital, 1437 Walnut Street.
1867 Wilson, James F., 1010 Race Street.
1869 Wilson, J. H. (N. R.)
1873 Winslow, W. H., resigned December 28th, 1876.
1864 Wistar, Thomas, resigned February 13th, 1867.
1875 Wolford, W. S., 133 South Thirteenth Street.
1863 Wood, Horatio C., Jr.*
1865 Woods, D. Flavel, one of the Physicians to the Presbyterian Hospital, 151 North Fifteenth Street.
1857 Woodward, J. J., United States Army, Washington, D.C. (O.M., N.R.)
1872 Worthington, David J., 116 South Fifteenth Street.

1876 Zeigler, G. W. (N. R.)

Members marked * have forfeited their membership.

CORRESPONDING MEMBERS.

1866 Bumstead, Freeman J. Died 1879.
1859 Clark, Alonzo, Professor of Theory and Practice of Medicine in the College of Physicians and Surgeons, New York.
1859 Dalton, J. C., Professor of Physiology in the College of Physicians and Surgeons, New York.
1860 Ellis, Calvin, Professor of Theory and Practice of Medicine in the Medical Department of Harvard University, Boston, Massachusetts.
1858 Flint, Austin, Sr., Professor of Theory and Practice of Medicine in Bellevue Hospital Medical College, New York.
1858 Hammond, William A., Member of the National Academy of Sciences, New York.
1860 Isaacs, Charles E., Brooklyn. Died June 16th, 1860, æt. 48.
1878 Jackson, J. B. S., Boston. Died 1879.
1860 Reeves, James E., Wheeling, West Virginia.
1861 Rokitansky, Carl. Died 1878.
1860 Watson, John, New York. Died June 3d, 1863, æt. 56.
1859 Worthington, Wilmer, West Chester, Pennsylvania. Died 1873.

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ADDRESS OF THE RETIRING PRESIDENT,

H. LENOX HODGE, M.D.,

Delivered October 23d, 1879.

Upon this twenty-second anniversary of the Pathological Society, it becomes my duty to present to you a short address as its retiring President.

During the three years that it has been my honor to preside over your deliberations, harmony has uniformly prevailed among the members. An earnest desire has been shown and persistent efforts have been made to increase the efficiency of the Society. These efforts have met with very gratifying success. I will enumerate a few of the changes made.

In order to avoid the necessity of a member bringing a microscope with him whenever he might desire to exhibit a microscopical specimen, a number of the members have presented to the Society a Zentmayer microscope. This has been placed under the care of the Curator, and is in use at every meeting of the Society. This has led to several important results. It has not only proved a convenience to members, but has induced the exhibition of a much greater number of microscopical sections of the pathological specimens presented. In addition, it has been the cause of a change in the duties of the Committee on Morbid Growths, and has led to the presentation by them of a microscopical section of every specimen referred to them for examination. These sections have been beautifully made by Dr. Seiler, a member of the committee, and have received careful examination at our meetings, and have given rise to interesting and instructive discussions. They are kept as a microscopical cabinet of pathology, and each one is properly labelled and numbered with reference to the committee's report and the discussion that may have followed its presentation. The high character of the reports of the Committee on Morbid Growths has been maintained, and its efficiency increased by the addition of several gentlemen deeply interested in such studies.

During my term of service a Business Committee has been formed. Their duty has been twofold, to classify the specimens proposed to be exhibited and to provide conversational meetings. In both of these respects the Society has good reason to congratulate itself and the committee. Ever since the appointment of the committee every notice of the meetings has included a memorandum of the specimens that were to be presented. The members thus know when specimens are to be exhibited and subjects discussed in which they are specially interested. Formerly this was done only occasionally; now it is done for every meeting. Sometimes, indeed, upon the notices there has appeared a list of specimens to be presented at two successive meetings. Thus the members were stimulated to add to those thus early announced similar specimens in their possession. At times the committee have been very successful. Among others, all perhaps will recall the "Brain" evening, in which there were presented four specimens of tumors of the brain; and the "Kidney" evening, in which the members had the opportunity of examining six specimens of diseases of the kidneys. The increase in the number of specimens presented, the carefully prepared and elaborate reports of the history of the cases, and the discussions which have arisen would have surprised and delighted some of our older members. For years it was their constant effort to obtain such results, and they will rejoice with us to learn that so great has been the success in these respects that it has been thought advisable to adopt a rule limiting the member who presents the specimen to ten minutes' time, and limiting also each member who takes part in the discussion to ten minutes.

There have thus far been four conversational meetings held. The times fixed for these meetings are April and September of each year. The first one was held on April 25th, 1878. These meetings mark a new era in the history of our Society. All will remember the elaborate and exhaustive paper by Dr. Tyson on the "Causal Lesions of Puerperal Eclampsia;" the practical paper of Dr. Brinton, giving the results of his large experience in the "Pathology of Stricture;" the interesting and scientific paper, with the beautiful micro-photographic illustrations, by Dr. Norris on "Optic Neuritis as a Symptom of Intracranial Disease;" and still more recently the able paper of Dr. Henry, and the interesting discussion which it elicited on some of the causes determining the nature of "Pleuritic Effusions."

The Transactions of the Society have been regularly published each year. The volume published in the fall of 1876 was the first that began the annual series. Prior to that time the volumes were issued irregu-

larly, and contained material that had been accumulating for various periods, always longer than a year, and extending once even to six years. The Society has now demonstrated for years its ability to issue a regular annual volume containing matter of great interest and importance. The excellent plan of arranging the Transactions remains the same. Dr. Tyson, who for many years was the able editor of the Society's Transactions, prepared one of the volumes. The last two have been edited by Dr. Simes, who has already proved himself a worthy successor in this important position.

The article of the Constitution directing the presentation of this address requires that such suggestions should be made for the future as experience may seem to indicate. The President, therefore, would call your attention to a few matters of importance.

There is now necessarily too much delay in the examination of microscopical specimens at the meetings of the Society. This should be remedied as soon as possible by the purchase of additional microscopes, or the members loaning several microscopes for every evening. It would be still better if some method could be devised by means of which the camera could be made to throw upon a screen the magnified image of the microscope. Then the exhibitor could indicate the points to which he would wish to direct attention, so that every member could see and understand his meaning at the same moment. Much time would be saved, the demonstration would be more effective, the illustration would be more interesting, and the discussion following would be more intelligent to all of the members. In the absence of this, an outline sketch upon the blackboard of the specimen under the microscope would in great part correct the inconvenience of the present arrangement.

The efficiency of the Business Committee would be increased by directing them to hold stated meetings, instead of waiting to be called together by their chairman or secretary. If these meetings were held for half an hour after each meeting of the Society, it would save the members time in coming together on a separate evening, and would enable them to act promptly in reference to the next meeting of the Society. These stated meetings occurring regularly and frequently, there would be less danger of the preparation for the conversational meetings being delayed until near the approach of the time for the holding of such meetings.

It would be wise, also, to avail ourselves more fully of the opportunities afforded in this city for the study of pathology. The rule requiring a paper to be presented with specimen is a very good one. We

have thus a more or less elaborate description of the specimen and a history of the case as far as known, all of which is of great importance in the study of such cases. We, however, lose many interesting specimens, which are not brought because the papers have not been prepared for want of time or inclination on the part of those having the specimens. What is of no use to them would perhaps be of great interest and value to some of us. Then, again, some gentlemen holding important positions, and possessing rare opportunities of seeing pathology, daily throw away specimens common enough to them, but which, if brought here, would find some members who would highly appreciate the opportunity of examining them. There would seem to be no practical difficulty in gathering daily from the different hospitals, dissecting-rooms, and private sources all specimens obtainable in the intervals of the meetings. These could be kept for a time in proper preservative fluids. Upon the evenings of the meeting, for one hour prior to the beginning of the proceedings, an opportunity could be afforded for examining these specimens, arranged upon tables around the room. There might be a table for the brains, one for the lungs, another for the stomach and intestines, another for livers, pancreas, and spleens, another for kidneys and bladder, another for tumors, etc. What a feast of pathology would thus be provided! What material would thus be obtained for future study! And each member would thus be able to follow up carefully any special subject in which he was interested.

But I will not detain you longer. A few brief words and I am done. The words are few, but they come from the heart. Your kindness has made my work during the last three years easy and very pleasant. Every meeting has bound us all closer together. Old friendships have been continually strengthened and new ones constantly formed. We have labored side by side to advance the common interests of our Society. Let us continue so to labor. Let nothing lessen our interest in the Society and its scientific work, and let nothing diminish our friendship for each other.

REPORT.

I.—THE OSSEOUS SYSTEM.

1. *Gelatinous arthritis of knee.*

Presented by Dr. H. Lenox Hodge, for Dr. John Ashhurst, Jr.

The specimen presented is the lower extremity of the femur, articulating surface of the tibia, and patella, from a patient whose thigh had been amputated the day before by Dr. John Ashhurst, Jr., at the Children's Hospital. The case was one of arthritis in a child of ten years, the subject of hereditary syphilis, who had been under treatment in the hospital for more than eighteen months. The first incision had been made as if for excision of the knee, but, the bone disease having been found too extensive to justify this operation, anterior and posterior flaps were cut, and the thigh amputated at its lower third. The specimen showed very well the characteristic gelatiniform change in the synovial and cartilaginous tissues, while the bone was markedly carious.

November 20th.—The flaps united by adhesion, and in ten days, the ligature having come away, the patient was looked upon as convalescent. Uninterrupted recovery followed the operation. *October 24th*, 1878.

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2. *Caries of the vertebræ and general miliary tuberculosis.*

Presented by Dr. E. T. Bruen.

Constantine W., æt. 31 years, was admitted to the Philadelphia Hospital, February 14th, 1879. He stated that deaths have occurred in his immediate family from acute diseases only, and there was no evidence of phthisis or scrofula. His sickness seemed to have dated from September, 1878; before this period he enjoyed perfect health. In the month just

mentioned his legs swelled slightly; he became constipated, with anorexia. Feelings of malaise, without any definite complaint, succeeded the above symptoms, and during January, 1879, he noticed that his abdomen commenced to swell and the œdema of the legs disappeared. There was no history of diarrhœa, jaundice, or vomiting, although he steadily lost flesh. When examined on the above date, his abdomen was found distended; the measurement thirty-seven inches; there was moderate ascites, but much of the distention of the abdomen was occasioned by gas in the intestines. There was no pain on pressure over any portion of the abdomen, nor was there any thickening of the abdominal walls; on the contrary, these tissues were thinned out and very compressible. The spleen was enlarged, dulness measuring six inches vertically by eight inches longitudinally. The liver was not increased in size, as was demonstrated by percussion. There was no œdema of the feet, no albumen in the urine, nor any abnormal deposit. Over the lungs the respiratory murmur was broncho-vesicular, the bronchial element predominating, and at the bases of both lungs fine subcrepitant râles could be heard over a space occupied by the breadth of two fingers. There was a persistent expectoration of white frothy mucus. Other physical signs were consistent with those obtained by the examination of a healthy chest. Heart-sounds were natural, and the limits of præcordial dulness were observed to accord with normal dimensions. Between the crest of the ilium and the lower ribs, in a position equidistant from both, and three fingers' breadth from the spines of the vertebræ, I noticed a swelling the size of a man's hand. This swelling felt doughy, very much the same feeling as when a fatty tumor is examined. This tumor, however, disappeared when the patient was placed on his face, and the spot became resonant, though the tympany was evidently transmitted. The size of the tumor was increased when the patient sat up, and the tumor was not altered by the act of coughing, nor was there any noticeable impulse communicated to it.

On four subsequent occasions I attempted to aspirate this tumor, using different needles of larger calibre each time. Twice after the operation the patient experienced an attack of hæmaturia, lasting five or six days, but subsiding after suitable treatment and rest. I was able to withdraw on each of these occasions a cheesy material sufficient to fill the needle of an aspirator, but never did I succeed in withdrawing pus in greater amount than half a drachm. The material, microscopically examined, contained shrivelled pus-cells, oil-globules, large amount of granular débris; also a few epithelial cells, many reddish-yellow spheres (which suggested spheres of leucin); the above indicated pus undergoing cheesy

degeneration. Without lingering over the many interesting clinical features of the case, I will state that the abscess was not believed to be connected with the liver, as there was absence of enlargement of that organ, jaundice, pain over hepatic region, or any history or evidence of intestinal disease. The abscess was believed to have an origin in the tissue surrounding the kidney, or to proceed from necrosis of the vertebræ. But the facts appeared to militate against the latter diagnosis, as there was no pain on pressure over any of the vertebral spines, and the ordinary tests of passing sponges wet alternately with hot and cold water up and down the vertebral column resulted negatively, as did Rosenthal's test with electricity. There was no spinal curvature nor pain when the erect position was assumed. To these facts I desire to call especial attention. The ascites, which diminished in amount during the treatment of the case, was attributed to tubercular peritonitis, due to the absorption of pus from the abscess, and tuberculosis of the lungs was suspected.

I would call attention to the statement that there was no abdominal pain nor retraction or thickening of the abdominal walls. Over the lungs, until within a week of the patient's death, which occurred April 1st, 1879, broncho-vesicular breathing continued, but at that time numerous fine, dry, crackling râles could be recognized from the apices of both lungs to their bases, and irregular patches of dulness could be mapped out on percussion. There was never any expectoration beyond the frothy mucus mentioned above. I would also say that over the abscess there was never any pain or any redness, although the cavity gradually became very superficial. Believing the abscess not to be due to caries of the spine, it was opened by my colleague, Dr. White, and at least ten or twelve ounces of pus in a cheesy, fetid state escaped, but on examination with a long bullet-probe dead bone could be distinctly recognized on the bodies of one of the dorsal vertebræ. The death of the patient was accelerated by the operation, through capillary oozing of blood occasioned by the diminished pressure on the vessels; yet, under similar circumstances, without the knowledge that caries existed, I should consider the operation justifiable.

It seems to me a question well worthy of discussion whether the best treatment of chronic abscesses without tendency to point is to open them to prevent general tubercular infection, or to risk this danger and avoid the operation through dread of increasing suppuration.

The temperature record from February 17th to April 1st ranged between 99° and 103½° F.

The *post-mortem* examination resulted as follows. On opening the abdominal cavity about a pint and a half of fluid was found within it. The intestines were closely matted together by tubercular inflammation, and slightly adherent; it was difficult to tear them asunder.

The peritoneum of the intestines themselves was thickly studded with typical miliary tubercle, and the diaphragm and peritoneum covering it were tightly bound down to the liver. The vessels of the intestines were injected, but the mucous surface of the ileum was free from ulceration. The spleen presented a most unusual appearance; in the parenchyma and beneath the capsule the miliary nodules could be noticed, but in addition discrete yellow masses of cheesy material could be recognized through the capsule, varying in size from a pea to a cherry; composed, however, as an aggregated material. On laying the organ open these could be seen scattered throughout the tissue, but leaving large masses of splenic pulp between them, differing thus from miliary tubercle. Orth speaks of similar masses as a second form in which tubercle is found chiefly in scrofulous persons. The patient's disease of the vertebræ was not traumatic; was it not scrofulous? Orth states that masses of this kind can be lifted out by the forceps without tearing the spleen, differing thus from a similar appearance in certain cases of leucocythæmia, in which instance the masses are adherent, being intimately involved in the structure of the follicles. These masses could be easily raised from their position by means of the dissecting forceps, and I believe them to be large-sized cheesy tubercle.

The liver appeared normal in size, but with an undue proportion of fibrous tissue, evidenced by the well-defined lobulation of the organ. The kidneys were large, weighing nine or ten ounces respectively; the cortical portion appeared swollen to a very marked degree. This is to be observed because no albumen was noticed in the urine during life, save only during the attacks of temporary hæmaturia. Neither liver nor kidneys presented any traces of tubercle macroscopically.

In the sheath of the psoas muscle a collection of pus was detected, which, had life continued, would doubtless have pointed in a few days, having burrowed down to Poupart's ligament. The body of the last dorsal vertebra was involved by caries, and the second lumbar vertebra contained a large sequestrum. The cavity in the body of this vertebra was large enough to contain a lime. The abscess had pointed behind, above the quadratus lumborum muscle. The cellular tissue back of the right kidney was normal, showing no evidences of inflammation.

In the *lungs* miliary and cheesy tubercles were abundantly distributed in the middle and upper lobes, but in the inferior lobes they were only

sparsely scattered, much of the parenchyma of the lung containing air, the vesicles being normal. In the apices of both lungs were found small abscesses of simple inflammatory origin as large as a lime. The pleura was much thickened, and the opposing surfaces of the pulmonary and costal pleura contained between their folds recent inflammatory lymph. In the walls of the pleura I found another small abscess containing cheesy pus. Doubtless, during the entire period he was under my care the tubercles had been slowly accumulating, but the physical signs were, I repeat, negative, until about one week before the death of the patient.

Dr. O'Hara said the specimen reminded him of the case of a woman who suffered from spinal caries of the lower dorsal and lumbar regions, and, in consultation with Dr. Willard, an abscess was supposed to exist. A plaster-of-Paris bandage was applied. She had suffered more or less for a period of two years. After the bandage was applied for some weeks, a large abscess pointed under Poupart's ligament. The patient, however, refused any surgical interference. A spontaneous rupture of the abscess finally occurred, and it continued to discharge pus for several weeks, when it ultimately healed. The woman was upwards of sixty years old, and is now in ordinary good health.

Dr. Hodge remarked, in reference to the diagnosis of caries of the spine, that he thought that the most delicate test of this pathological condition is the pain produced by motion. Even when no pain is experienced upon pressure along the line of the spine, the patient will be unable to stoop and raise himself again without suffering pain and without the help of his arms.

Formerly the abscess was left to terminate itself, or the surgeon waited until it was nearly ready to rupture, and then opened it by a valve-like incision. Lately many have advocated the antiseptic method. Dr. Hodge has had very good results in the opening of such abscesses under the carbolic acid spray, as advocated by Mr. Lister, and also by the use of the hyperdistention method of Mr. Callender.

Dr. Bruen said the diagnosis of the case during life, in consultation with his colleagues, had been either perinephritic abscess, or abscess in the walls of the abdomen. Though caries was suspected, the idea was dismissed as untenable, because all the symptoms of caries, though looked for, were absent. The abscess would not have been opened had the diagnosis of caries been sustained. The operation was performed to prevent a general tuberculosis by absorption of pus.

The temperature was too high in the evening and too low in the morning to indicate acute miliary tuberculosis. In three cases of this disease that

he had previously seen, the temperature had never been over 102° F.; the average being from 99½° and 101° F. until just before death, when there was a fall to 97° F., attended by a profuse sweating. Indeed, his cases were all marked by the occurrence of frequent profuse sweats. The duration of the lives of these patients was from ten to fifteen days, with *very rapid pulse.* The reason Wunderlich gives a higher range of temperature in acute miliary tuberculosis he believes to be due to the association of inflammatory catarrhal complications in the cases he has reported. In the patient before us there was evidence of catarrhal inflammation in the lungs, and also the suppuration, to prevent the temperature being typical; nor was there any sweating.

The nerves issuing from the spine at the position of the caries were not involved in the pathological process, and therefore the symptom of pain was not elicited upon the application of hot and cold sponges along the spine. The electrical current he did not think reached the diseased points. These facts accounted to his mind for the failure of the most reliable tests, but he had no explanation to offer for the absence of pain on movement or when the erect position was assumed. The absence of pain on pressure, retraction of the abdomen, or thickening of the abdominal walls was remarkable, when the extent of the tubercular inflammation is considered. *April 10th*, 1879.

Report of the Committee on Morbid Growths:

"A microscopical examination of a thin section of the spleen demonstrates the whitish nodules to consist of lymphoid cells, with a delicate fibrillar, reticular, intercellular substance. At the centre of the nodules their structure has undergone a granular metamorphosis, while their periphery retains the adenoid character. No blood-vessels could be observed in the nodules. The new formations may be considered tubercles experiencing caseous transformation." *May 22d*, 1879.

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3. *Spindle-cell sarcoma of the knee.*

Presented by Dr. H. Lenox Hodge.

This specimen was removed by amputation through the thigh, on March 22d, 1879, from a woman 54 years of age. She had never married. Her occupation was that of a school-teacher. Her general health had always been delicate. She first began to suffer from weakness and

pain in the region of the knee, in April, 1877. In May, 1878, she began to use crutches on account of increasing pain in the knee. Since then the pain has become so severe as to confine her to bed, and to require the constant use of anodynes. Her general health has been greatly impaired, but there is no evidence of disease elsewhere than at the knee. The operation was done at the Presbyterian Hospital. The following report and examination of the tumor has been made by my friend Dr. Seiler, pathologist to the hospital:

"PHILADELPHIA, April 4th, 1879.

"DR. H. LENOX HODGE: Dear Sir,—On making incisions into the tumor of the knee, I found that the interior was composed of a dark-red mass, having the consistence of a soft clot, extending around the knee-joint under the skin and subcutaneous connective tissue down to about five inches below the head of the tibia, and above to about three inches above the joint. The upper fifth of the tibia was denuded of its periosteum, and the surface of the bone roughened, while small detached pieces of bone were found in the red mass in the neighborhood of the head of the tibia. The patella and the femur were apparently not affected. Several nodules, varying in size from that of a walnut to that of an egg, containing the same dark-red clot-like substance, were found in the tissues adjacent to the central mass. On splitting the tibia and femur lengthwise the medulla of the former presented a dark-red appearance, filling not only the shaft but also the head of the tibia, occupying the place of the cancellated structure. The medulla of the femur appeared normal.

"A microscopic examination of the central mass proved it to be composed of plates of osseous cartilage, connected with each other by a delicate net-work of fibrous tissue, the meshes of which were filled with red blood-corpuscles.

"A section made from the periphery of the mass showed under the microscope small, spindle-shaped cells lying in close contact with each other, having large oval nuclei, while the vessels appeared to be nothing but channels between the cells. The medulla from the head of the tibia exhibited the same character of cells. From these appearances, I would infer that the tumor is a spindle-celled sarcoma, having undergone teleangiectatic degeneration with cartilaginous transformation.

"C. SEILER."

April 10*th*, 1879.

4. *Metacarpo-phalangeal and phalangeal joints from a case of rheumatoid arthritis.*

Presented by Dr. Louis Starr.

Ann ——, æt. 50 years, was admitted to the Episcopal Hospital on December 2d, 1878, suffering with acute mania. No history could be obtained. The fingers of both hands were strongly flexed, forming an acute angle with the palms, and were dislocated in the direction of flexion, at the metacarpo-phalangeal joints. The bases of the first row of phalanges rested against the palmar surfaces of the shafts of the metacarpal bones, and the convex, somewhat roughened heads of the latter projected half an inch beyond the dorsal surfaces of the phalanges. The phalanges were crowded together, and their combined breadth was less by half an inch or more than that of the metacarpal bones. Voluntary movements were limited to slight, inefficient flexion and extension, and any attempt at further motion caused pain and produced a sensation of moist crepitation. The fingers were abducted; the second and third phalanges were extended, and the joints were stiff. The thumbs were unaffected; their movements, if anything, being more than usually free. The four lesser toes of each foot presented the same conditions as the fingers, though in a less marked degree; the great toes, like the thumbs, were unaffected. There were no evidences of cardiac, pulmonary, or renal disease. Death occurred on December 10th.

At the *autopsy* the metacarpo-phalangeal and the first phalangeal joints of the right middle finger only were examined. Metacarpo-phalangeal joint—anterior ligament thickened, posterior ligament deficient. Articular cartilages entirely absent. Articular facets of bones roughened by osseous protuberances and somewhat eburnated. Protuberances most marked on metacarpal bone. Attempt at a new articular facet on the palmar surface of metacarpal bone behind its head, where the base of phalanx rests; new surface covered with fibrous tissue and red, villous projections. Articular cavity dry. Phalangeal joint—a few red, villous processes from the synovial membrane extending between the articular surfaces; otherwise healthy. *April 10th*, 1879.

II.—THE DIGESTIVE APPARATUS.

1. *Carcinoma of the liver, pancreas, and cœliac glands.*

Presented by Dr. Louis Starr.

Thomas M., æt. 49 years, a laborer, was admitted to the medical ward of the Episcopal Hospital on October 26th, 1878.

His family history was healthy. He had never had syphilis, and had always been moderately temperate in his habits. With the exception of an attack of pneumonia in early life, he had been little troubled with sickness until 1872, when he began to suffer from occasional asthmatic paroxysms, and from dyspepsia and constipation. He had never felt any anxiety about his health, however, until June, 1878, when he noticed that the ingestion of food gave rise to pain in the epigastrium, and was quickly followed by vomiting, the material ejected being sometimes mixed with blood. Soon afterwards he became jaundiced, and commenced to fail in flesh and strength.

On admission, he was greatly emaciated and very weak. There was considerable pain in the epigastrium, extending through towards the back; marked, though not intense, jaundice; obstinate hiccough; frequent vomiting of food together with bile-stained mucus, and slight diarrhœa, the evacuations having a green color and containing a small amount of blood.

Upon making an examination of the abdomen, the liver was found to be greatly enlarged, occupying and thrusting outward the epigastric and the upper part of the umbilical and right lumbar regions. The edges of both lobes could be distinctly traced with the fingers, and were thick, firm, and nodulated, while over the anterior surface of the organ several large and many small hard nodules could be perceived through the abdominal parietes. The upper border of the liver, as determined by percussion, was in the normal position. In contact with the left side of the abdominal aorta, just below the margin of the left lobe of the liver, a firm, convex mass could be felt.

Auscultation of the chest revealed dry pleural friction-sounds over the left side posteriorly.

The vomiting ceased soon after the patient entered the hospital, and there was some slight improvement in his general condition; but this lasted for a few days only, and was succeeded by rapidly-increasing prostration, and death on November 8th.

The *post-mortem* examination was made twenty-six hours after death.

On opening the abdomen, the small intestine was observed to be pushed downward and to the right, and the stomach downward, backward, and to the left. The left lobe of the liver filled the epigastric region, extending in the median line three inches and a quarter below the ensiform cartilage. The cleft between the right and left lobes was deep, and occupied a position a little to the right of the median line. The lower margin of the right lobe, anteriorly, was four and a half inches below the ensiform cartilage; laterally and posteriorly it was two inches lower still. The gall-bladder projected two and a quarter inches beyond the edge of the right lobe. The enlargement of the liver was symmetrical, and had taken place chiefly in a downward and transverse direction, the thoracic space not being materially encroached upon, and the border of the left lobe being almost in contact with the left side of the abdominal cavity. The edges of the organ were more obtuse than usual, and its capsule was thickened, especially along the anterior edge of the right lobe and over the superior surface of the left lobe, in which situation it was tightly adherent to the diaphragm. Its weight was nearly six pounds. The hepatic tissue was dark-green in color, and thickly studded with hard white nodules, which were round or oval in shape and varied greatly in size, many being no larger than a No. 6 shot, while others measured an inch, and one, at the under anterior part of the left lobe, two inches in diameter. These nodules were somewhat elevated above the surrounding surface, and a few of the largest were umbilicated. The gall-bladder was pear-shaped, was considerably distended, measuring five inches in length by three in width, and was filled with bile apparently normal in color and consistency. The cystic duct was patulous. The hepatic duct with its two branches and the ductus communis choledochus were distended to at least four times their natural size. In addition to this general increase in calibre, there was a saccular dilatation of the common duct a short distance from the point of entrance into the duodenum; and just beyond this sac the duct was compressed by the head of the pancreas. The orifice of the common duct was large enough to admit an ordinary probe. The head of the pancreas was tightly adherent to the duodenum, and rested upon and stretched downward to the left of the abdominal aorta; the body of the gland extended upward and backward,

the tail touching the spleen, which was situated behind the stomach, in contact with the posterior wall of the abdomen. The pancreatic tissue was firm, the head especially being hardened, nodulated, and enlarged. The pancreatic duct was considerably dilated. The cœliac glands were greatly enlarged and hardened.

The stomach was moderately large; its mucous membrane was thickened, congested in patches, and covered with tenacious mucus. On the smaller curvature, midway between the cardiac and pyloric orifices, there was a *chronic* ulcer, oval in outline, the longer diameter measuring about one inch, and being directed transversely to the axis of the stomach. The edges of this ulcer were well defined and slightly inverted. The base, formed by the thickened serous coat of the viscus, was paler than the surrounding mucous membrane, and smooth. In several positions the mucous membrane was eroded, probably by post-mortem digestion. The largest of these erosions, an inch and a half in diameter, was situated upon the smaller curvature, near the cardiac orifice. It was irregular in shape, with an uneven base and ill-defined everted edges. The mucous membrane of the duodenum was also thickened, and over the seat of attachment of the head of the pancreas there was a large oval ulcer. The long diameter of this ulcer was parallel with the axis of the intestine; the edges were indurated and puckered, and the base seemed to be formed of the pancreatic tissue.

The spleen was healthy.

The kidneys were deeply stained by the coloring-matter of the bile, but were not otherwise abnormal.

The peritoneal cavity contained a small quantity of serous fluid, and the parietal layer of the peritoneum was thickened, particularly at the upper part of the abdomen. On opening the thorax, the left lung was found to be adherent over its whole surface to the chest-wall and diaphragm. The right lung was large and incompletely retracted, the air-cells of the upper lobe and of the anterior margins of the middle and lower lobes being in an emphysematous condition. At the lower edge both of the middle and of the lower lobe, laterally, there was a hard white nodule, slightly elevated above the surrounding lung-tissue, the one in the lower lobe, the larger of the two, measuring about half an inch in diameter. The lower posterior portion of each lung was œdematous, and the serous fluid, which escaped freely on section, was tinged with bile. The bronchial glands were increased in size.

There was a small vegetation upon one of the leaflets of the aortic valve; in other respects the heart was normal.

The tissues throughout the body were more or less stained with bile.

The histological examination of the diseased organs was made by Dr. Simes, the pathologist of the hospital, who reported as follows:

"From a microscopic examination of the indurated portion of the pancreas, it is found to present throughout its structure a very great increase of the fibrillar connective tissue, both inter- and intra-lobular. Traversing this tissue are seen round, oval, and longitudinal sections of cylinders, lined with columnar epithelial cells.

"The new formations in the liver consist of similar elements and have an arrangement analogous to that seen in the pancreas.

"A thin section, taken from the margin of the ulcer situated in the duodenum, presents an arrangement of histological elements similar to that found in the liver.

"A section made from one of the enlarged glands taken from the fissure of the liver shows most distinctly the pathological new formation, which is here of the same character as that in the duodenum, pancreas, and liver,—viz., a cylindrical-celled epithelioma."

From this report I am justified in regarding the carcinoma of the liver, the pancreas, and the lymphatic glands as secondary in nature, the primary lesion being seated in the mucous membrane of the duodenum.

November 14th, 1878.

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2. *Rectal calculus.*

Presented by Dr. R. W. Deaver.

On the 1st of November, Mrs. Y., a monthly nurse, æt. 55, called my attention to a small "hard lump" situated just within the anal orifice, which, she said, had first made its appearance six weeks previous. She stated that it was loose and movable, and that in the process of defecation it came down, acting like a ball-valve, so completely shutting off the canal that she was only able to have a motion of the bowels by placing her finger in the anus and holding back the "lump," allowing the fæces to pass beside the finger.

Previous to its appearance her bowels had been very regular and moved daily; now she would allow them to go four and five days, on account of the annoyance.

Digital examination proved the existence of a rounded tumor about the size of a pigeon's egg within the sphincter, covered by mucous mem-

brane, and at first gave the impression of a fibroid on the posterior aspect of the uterus; but upon making a vaginal exploration with the finger it could not be felt. It was readily pushed up by the finger into the bowel, but the mucous membrane covering it was always present. As the examination gave her considerable pain, I concluded to resume it under ether, which I did the following day, with the assistance of Dr. Müller. As soon as the anæsthesia was complete, Dr. Müller passed his finger into the rectum and verified the covering of mucous membrane, but, by pushing it up as far as his finger would pass, dislodged it from its pocket into the bowel, from which it was easily removed.

There was no history of biliary colic further than an attack of cholera morbus some two years ago, which had been treated by homœopathy and herself. Ten years ago she had a perineal abscess, which was opened by the knife, and healed slowly, and from which there is a small, non-suppurating fistule, involving the muco-cutaneous membrane, a quarter of an inch from the anal orifice, and without the sphincter.

December 12*th*, 1878.

Report of the Committee on Morbid Growths:

"A section of the rectal calculus presented by Dr. Deaver showed it to consist of a nucleus, body, and cortex.

1st. *The nucleus.*—This was found to consist almost entirely, if not entirely, of granules of altered bile-pigment, apparently containing neither cholesterin nor any appreciable quantity of inorganic salts.

"2d. *The body.*—This was made up principally of cholesterin arranged in a radiating manner around the nucleus. A small amount of bile-pigment, also earthy salts, were diffused throughout this portion.

"3d. *The cortex*—Consisted of laminæ arranged around the body as a rind, and was composed of cholesterin, with a large proportion of bile-pigment and earthy salts.

"The presence of glycocholic acid was determined from a watery extract made of both the body and cortex. It no doubt was diffused through both.

"Microscopic examination demonstrated the presence of crystals of cholesterin and phosphates." *December* 26*th*, 1878.

3. *Gangrenous inflammation of the duodenum.*

Presented by Dr. J. T. Eskridge.

I am indebted to Dr. C. for the history of the following case.

"Mrs. E. M., æt. 55, born in Norfolk, Va., where she lived for thirty-nine years, eighteen years married, sixteen years a widow, mother of four children, was a large, muscular woman, always enjoying excellent health till about 1874, when, living in Washington, D. C., she had intermittent fever at different times, and occasionally suffered from what she called 'cramp colic.' Some of these attacks were marked by persistent nausea and violent vomiting. Her father suffered from no hereditary disease; her mother died of cancer of the uterus. Beyond this, no positive history of cancer could be traced to other members of her family.

"September 16th, 1878, she was seized while walking the streets of this city, about one and a half squares from her residence, with a sense of weight in the epigastrium. She hastened home, threw herself upon the lounge, and had a severe chill or rigor, attended with great nausea and vomiting. I saw her about fifteen minutes afterwards, and found her somewhat delirious, with severe retching eructations of a brownish frothy fluid, pulse 120 per minute, weak and fluttering, cold extremities, large drops of cold clammy perspiration covering the surface, but she crying that she was burning up, and begging for ice-water to cool her internally. Gleaning a history of malaria, I suspected a congestive chill, and treated my patient accordingly, and also endeavored to relieve the nausea and pain of which she complained.

"*September* 17*th*, morning.—She is more comfortable; nausea continues, with lightness of head and dimness of vision; there is no pain over the epigastrium, but there is great tenderness to the touch in this region; pulse 112, temperature 103° F.; tongue covered with a grayish fur, papillæ enlarged, and bowels constipated. The bowels are so stubborn as to require active and powerful purgatives before a slight evacuation from them is effected. The stomach is very irritable. Citrate of magnesium is the only agent I find that will check the vomiting. The stool on this occasion is dark.

"*September* 18*th*.—Two days after my first visit I learn that she had been delirious during the night; complains of great pain in the head and left hypochondrium, and inability to lie on the left side. Nausea and vomiting still troublesome; bowels opened once; pulse 118 and weak; temperature 103½° F.; first sound of heart weakening.

"*September* 19*th.*—Pain in splenic region much greater; stomach more tolerant; pulse 116, temperature 103° F., and bowels costive.

"*September* 20*th.*—Vomiting checked, but nausea continues; bowels opened once; stool dark; pulse 112, temperature 103° F.; pain in same region.

"*September* 21*st.*—Pain referred to epigastrium instead of the splenic region; pulse 110, temperature fallen to 102½° F.

"*September* 22*d.*—Tongue reddened at its tip and edges, but heavily coated in the centre; intense pain in the epigastrium; pulse 110, temperature 102½° F.; bowels opened twice.

"From this time she gradually improved; pulse and temperature both decline gradually till, October 1st, she is able to sit up for a short time, though she presents a very sallow appearance, as she has done throughout her illness. The conjunctiva is clear. Between this time and November 16th, the beginning of her fatal illness, I saw her several times. She never grew strong, and required a smart purgative to unload the bowels.

"*November* 16*th.*—I am summoned hurriedly, and find her with a severe chill or rigor, nausea, vomiting, shortness of breath, and great pain in the right hypochondrium. Supposing a return of malarial trouble, I treat as on September 16th.

"*November* 17*th.*—The nausea and shortness of breath continue; a constant dull pain in right hypochondrium, extending over epigastrium; pulse 85, temperature 101° F.; bowels constipated for several days, urine scanty.

"*November* 18*th.*—Bowels opened once; shortness of breath more marked; sits up in bed and gasps for breath; yet I am unable to detect any abnormal condition of heart or lungs; pulse and temperature same as the day before.

"*November* 20*th.*—Patient delirious during the night; is very despondent, and says she will not live; shortness of breath and tenderness same as two days ago; great tenderness over the epigastrium; pulse 90, temperature 100° F.

"*November* 21*st.*—More delirious; gradually sinking; pulse 95, temperature 101½° F.

"*November* 22*d.*—Delirium increasing; pulse and temperature the same; a smothering sensation. The next day the pain is most intense over the pyloric region of the stomach; pulse 100, temperature 102° F.

"*November* 24*th.*—Pulse 105, temperature 102½° F.; is very much prostrated; a craving for food at 2 A.M.; spat up blood during the night,

and does not attempt to move the right arm from the morning of the 24th till the morning of the 26th, when she died.

"*November 26th.*—Pulse 118, temperature 103° F.; apparently insensible, but evinces evidence of pain when touched in the epigastrium. She died calmly on the morning of the 26th.

"Her treatment throughout both attacks of her illness consisted in large doses of quinine, morphia, and brandy when there was any evidence of the vital forces failing; besides, calomel was used in small doses, and a fly-blister from time to time over the painful portion of the abdomen."

Autopsy, twenty-six hours after death, by Dr. Eskridge.—Body appeared well nourished; no abnormal amount of fluid in the abdominal cavity; liver, kidneys, and pancreas apparently healthy. Spleen small, and covered by little vesicles; its interior was intensely reddened and granular as seen by the unaided eye. The mucous membrane of the stomach was congested, but no ulcerated spots; its walls apparently normal throughout. Mucous membrane of the duodenum almost black, ending abruptly, about twelve inches from the pyloric valve of the stomach, in almost healthy mucous membrane, its walls very dark and easily torn, and surrounded by a localized peritonitis. The remaining portion of the bowel appeared healthy. The gall-bladder contained a large gall-stone. The uterus was inflamed and enlarged, its appendages normal. The thoracic and cranial cavities were not examined.

Remarks.—Had I known the history of the case for the last week previous to death, I should have examined the thoracic cavity. From the history, in the absence of an autopsy of that cavity to the contrary, a pneumonic inflammation may justly be suspected. The doctor under whose care she was during her illness did not suspect any trouble in the bowels, and especially none of an inflammatory character; hence the rather free use of purgatives, which his good sense would have taught him to avoid if he had been aware of the real trouble.

He tells me that he was not satisfied with his diagnosis, but suspected malarial poisoning, inflammation of the liver, and probably cancer of that organ, and possibly of the stomach or adjoining viscera.

December 12th, 1878.

Report of the Committee on Morbid Growths:

"A microscopic examination of the spleen from the case of gangrene of the duodenum presented by Dr. Eskridge exhibits the changes peculiar to chronic inflammation, viz., an increase of the fibrillar connective tissue

of the organ. This is particularly evident around the blood-vessels, where the adventitia is seen in a manifest state of proliferation."

December 26th, 1878.

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4. *An account of a case of congenital malposition and immobility of the intestine.*

By Dr. Arthur V. Meigs.

The ante-mortem notes of the case were furnished me by my father, Dr. J. Forsyth Meigs, who attended the child for some time before it died. The child was born about the middle of June, 1874. When born it was rather weak, and did not very thoroughly establish its respiration; it was somewhat bluish for the first ten days of its life, and cried but feebly. The nurse thought the action of the heart too strong and too frequent, and that the breathing was not natural. The accoucheur who attended the mother believed that the child had not expanded the lungs thoroughly, and that it would probably improve in time. It took the breast well, and the mother (a healthy woman) had plenty of milk.

When about two weeks old it began to cry violently and persistently, as though with some severe pain. This continued from time to time until August 24th, when the child was sick and suffering; it was hard to say why, for it did not look badly. It was rather small, but not emaciated; the bowels were moved every day, and the stools were well digested. It was very drowsy, and lay with the head drawn backward, breathing with some effort; but it had had a full dose of morphia on this day. The respiratory sounds were natural; the heart beat rather violently, and over a larger area than usual, but there was no abnormal sound; the abdomen was somewhat full and tympanitic, but not hard or painful on pressure. It took the breast freely.

There seemed to be some fault in the digestion, and that possibly the child might be hungry. The main symptom was the screaming, as though with some severe and steady pain, often for two or three hours at a time. A trial of feeding was advised, and equal parts of milk, cream, lime-water, and thin arrow-root water were ordered; also a carminative of paregoric, aromatic syrup of rhubarb, bicarbonate of soda, and mint-water. After this the screaming still went on, so as almost to madden the mother, and the infant began to grow thin and weak. Inunctions of cod-liver oil were used. Deodorized tincture of opium was given, one or two drops at a time. It was seized with coryza and cough, and began to sink.

September 12th, it was very ill, had become quite thin, and was feeble and took very little food. Pulse was 168, and respirations 84. Loud, coarse râles were audible all over the chest and some distance from the body. The respiration was distinctly bronchial. The case looked like one of acute tuberculosis or catarrhal pneumonia. From this time the child sank, and died on the 13th or 14th.

I made a *post-mortem* examination September 15th, 1874.

The body was very small and emaciated.

Lungs.—Neither was very fully expanded, but the left crepitated throughout. There were spots at the lower edges of the upper two lobes of the right lung, which were hard and dark-colored and did not crepitate at all. Both apices were crepitant.

Heart.—The walls of the auricles were only about one-eighth to one-sixteenth of an inch thick; the foramen-wall was entirely closed. The walls of the ventricles were from one-third to one-half an inch thick, that of the right being slightly thicker than the left. The mitral, tricuspid, and aortic valves were healthy.

Liver, healthy.

Intestines.—The duodenum came off from the stomach as usual, passed under the liver, and descended to the level of the right kidney, where it made a sudden reverse turn and passed back parallel to its downward course. For about three inches before and three after it made the sharp bend the intestine was tightly bound down, being almost absolutely immovable. The small intestine, after leaving the region of the kidney, instead of passing behind the colon as usual, made a bend forward and passed in front of it, slightly to the right of the median line. Where the two intestines crossed each other they were tightly bound down; the mesentery being very short, they had consequently little motion upon each other. The rest of the small intestine was healthy. The lower half of the transverse and half of the descending colon were tightly adherent to the posterior wall of the abdomen, there being almost no mesentery. The rectum and lower half of the descending colon were greatly distended with gas. There was not the slightest apparent narrowing of the calibre of the intestine anywhere.

This child died from the condition of its intestine. It never thrived, but suffered constantly from intestinal trouble,—so much so as to cause the attending physician to suspect some obstruction of the bowel, which proved to be the state of the case, for at the point where the small crossed in front of the large intestine the two were so closely fastened together that it would have been impossible for both to have been fully

open at the same time. If one was patulous, it encroached upon and pressed in the walls of the other; so that if both were at work at the same time, a considerable amount of ingesta passing up the small intestine, the large also doing full work, one of the streams must have been stopped or greatly impeded. Then there was the great immobility of the intestine at different places. The jejunum had hardly any mesentery at all,—both before and after it made its very sharp reverse at the region of the kidney. The large intestine also was, as stated in the notes, less free than usual in about half its entire length. That the child should have had such violent pain as to make it scream so continually is strange. I cannot explain it. Perhaps this condition of things may help some one to explain the mechanism of the production of colic. The collapse of the lungs, which was the immediate cause of death, may possibly have been produced or, at least, increased by the continual and violent crying of the child. This suggestion I would call especial attention to, as an additional argument in favor of the theory which is advanced by my father, Dr. Meigs, in an article in the *American Journal of Obstetrics and Diseases of Women and Children* for January, 1879, that prolonged violent crying may produce collapse. Another curious feature was the fact that the right ventricle was thicker than the left. I cannot understand why this should have been. *May 22d*, 1879.

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5. *Tubercular ulceration of ileum.*

Presented by Dr. Frederick P. Henry.

D. S., æt. 53, male, white, was admitted to the Episcopal Hospital on March 3d, 1879, and died about June 1st. When I first saw him, on April 1st, he was greatly emaciated and extremely feeble, with a pulse that was pretty uniformly at about 100, slight and infrequent cough, and, although there was very marked dulness on percussion over the upper half of left thorax, inspiration was so feeble, owing to extreme atrophy of the muscles concerned in the act, that râles were never detected. There was diarrhœa, ranging from five to ten watery stools daily, in which blood was never observed. The man had been addicted to the use of opium in what may be called a moderate degree, never having exceeded ʒiss of laudanum per diem. The case gradually proceeded to a fatal termination. The treatment consisted in astringents, opiates, cod-

liver oil in the form of pancreatic emulsion, and, later, by inunction and prophylactics against bed-sores.

At the *autopsy* the lungs were found far advanced in phthisis, especially the left; the surfaces of both were very uneven and puckered, and some small cavities were found in the apices of both, the largest—about the size of a walnut—in the left. The pleuræ on the left side were universally firmly adherent, but on the right there were parts free from adhesion, although here also the adhesions were very extensive. All the tissues examined were very dry, and the large veins contained very little blood. The great omentum was completely destitute of fat, and resembled a simple serous membrane; its vessels, as well as those of the mesentery, were plainly visible, and, on holding them up to the light, a beautiful picture of the vascular distribution was obtained. The mesenteric glands were all enlarged almost uniformly, the largest being about the size of a Lima bean. The mucous membrane of the ileum was the seat of a number of tubercular ulcerations, scattered along it at intervals of from one to three feet. They were of typical appearance, their long axis being at right angles to that of the intestine, while the peritoneum opposite their base was studded with miliary tubercles. The kidneys were moderately granular. *June 12th*, 1879.

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6. *Hemorrhagic infarctions of the mucous membrane of small intestine.*

Presented by Dr. Frederick P. Henry.

In addition to the intestinal specimen, there are before the Society a small ovarian cyst, a hemorrhagic infarction of the liver, and a pair of cystic kidneys, all taken from the same subject. I have given prominence to the intestinal lesion because it is rarer than the others, and because I have just presented a specimen of intestinal disease.

The patient was a white female, æt. 24, who was admitted to the Episcopal Hospital on May 24th. I saw her once at her house before her admission, and made the diagnosis of peritonitis. She went to the hospital the next day (Saturday), arriving after I had made my visit, and died on Monday morning. The clinical history, therefore, is a short one, and is condensed from notes made by Dr. Bickford, the resident physician.

The patient says she has always been healthy until the present time. Menstruation has been regular until the last period, which was delayed two weeks, the discharge appearing the day before admission. The attack

began on Wednesday, after three or four days of malaise, headache, pain in back and stomach. On Wednesday she was obliged to stop working at the laundry where she was employed. On her way home she had a chill, followed by high fever, which has continued up to the present time. There does not appear to have been the usual severe pain of acute peritonitis. At the beginning of the attack the bowels were quite loose. Tongue dry and bright red. There was tenderness in right iliac region, and in a lesser degree in the left; aching pains over the whole body, especially on moving; a tympanitic abdomen, and some nausea and vomiting.

On the 25th the menstrual flow continued, and the abdominal pain was more severe; there was also more vomiting and a greater degree of nausea. The pulse in the evening was 140, and the temperature 103° F. Death took place, somewhat suddenly, on the 26th, at 6 A.M., immediately after the patient had sat up in bed to take some nourishment.

Autopsy.—The peritoneal cavity contained about Oj of turbid serum. The intestinal coils, where free from lymph, showed an intense degree of congestion. Unattached masses of lymph were found in different parts of the abdomen, and were so consistent as to be readily lifted and removed by the forceps. The amount of lymph was greatest in the hypogastric region, and the external surface of the uterus was greatly congested, although free from lymph. No pus was to be seen. There was an ovarian cyst, the size of a large orange, occupying the site of the right ovary, which contained a limpid, straw-colored liquid. The surface of the liver was the seat of a number of minute cysts, and on the superior surface of the left lobe there was a hemorrhagic infarction, whose circular base, nearly the size of a quarter-dollar, corresponded to the liver-surface, below which it was slightly depressed. On section, it was found to be in shape like a triangle with rounded apex. The kidneys presented an extreme degree of cystic degeneration, the left containing one cyst the size of a walnut and numerous others of smaller size, while the right was of an almost sieve-like appearance on section, owing to the number of cysts divided. The intestinal mucous membrane, at various points, was the seat of hemorrhagic extravasations of circular form, the largest the size of a small pea; they were easily ruptured, and gave exit to fluid blood. The uterine mucous membrane, especially the cervical portion, was intensely congested. There was double pleurisy, with a small amount of turbid effusion at the bottom of both pleural sacs, and soft lymph on the pleural membrane.

In this case there are two distinct processes of disease,—a chronic

and an acute,—the former being the predisposing cause of the latter. The causal relation between extensive inflammation of serous membranes and chronic kidney-disease is a well-established fact in pathology. The nature of the woman's occupation is also to be considered, both in the etiology of the peritonitis and in that of the menstrual suppression which was probably the exciting cause of the former. Hemorrhagic infarction is less commonly observed in the intestine than in the stomach, where it is recognized, by some authorities, as the first stage in the development of gastric ulcer. *June* 12*th*, 1879.

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7. *Portion of colon from a case of chronic intestinal catarrh.*

Presented by Dr. Louis Starr.

This piece of intestine, comprising the ascending colon, with the beginning of the transverse colon, was obtained from a man who was formerly a patient in the medical ward of the Episcopal Hospital. He was 58 years of age, an engineer, and had enjoyed fair health until eight months before admission. Subsequently he had suffered from diarrhœa, the evacuations varying much in frequency, often numbering, according to his own statement, twenty or thirty in twenty-four hours, but sometimes only three or four, while occasionally there was no movement of the bowels at all for a day or two. After the onset of the diarrhœa, prostration and loss of flesh were rapid and continuous. One month before admission his feet and legs became œdematous.

When first seen he was very weak and anæmic; there was general anasarca, and there were frequent (twenty in twenty-four hours) copious evacuations of the bowels, the stools consisting of colorless liquid containing masses of mucus and partly-digested food. The urine was diminished in quantity, but was otherwise unaltered. No lesion of the heart or lungs could be detected.

Death occurred two days after entering the ward. At the *inspection*, all the viscera were found to be normal except the large intestine. This seemed to be reduced in calibre, and, when laid open, the whole of the mucous membrane, from the ileo-colic valve to the lower part of the rectum, was found to be studded with minute ulcers about as large as a pin's head, the intervening portions being ash-colored, thickened, and covered with villous projections.

I am indebted to the resident physician, Dr. D. J. Milton Miller, for the notes of this case. *June* 12*th*, 1879.

8. *Concretion from the vermiform appendix.*

Presented by Dr. Frederick P. Henry.

C. F., a machinist, of temperate habits, was admitted to the hospital of the Protestant Episcopal Church on June 6th, 1879, having been ill one week. On admission, he complained of pain over the whole abdomen, which was, however, particularly severe over the external portion of the right hypochondriac region. The tongue was slightly furred, and there was occasional bilious vomiting. Pulse 88, and very tense; temperature 101° F. The urine was acid, specific gravity 1027, and contained a trace of albumen. A microscopic examination which I made on the 16th revealed the presence of a few faintly granular casts. No cause for the attack was known, and the onset was gradual. After two or three days of malaise, poor appetite, and sensation of fatigue, pain, described by the patient as resembling that of a bruise, was felt in the abdomen, especially in the right side. This pain gradually increased in severity until it became extreme. There was a history of previous attacks of intermittent fever,—the last in 1873,—and of articular rheumatism in 1876.

The decubitus was dorsal, with the right thigh and leg strongly flexed.

Without entering into the details of treatment (which were, however, of unusual interest), I may say that, the diagnosis of acute peritonitis being manifest, the main reliance was placed upon morphia. As an example of the manner in which the drug was used, I will mention that by the 11th, five days after admission, the patient had taken, of liquor morphiæ sulphatis, one hundred and fifty-eight drachms, with alleviation of all the symptoms, and without the production of narcotism. This was at a period when the drug was most sparingly used. At a later stage it was given on several successive days, in doses of gr. ss, every hour for the greater portion of the day, and, in spite of this, the respirations were never less than eighteen per minute, and, although the pupils were very greatly contracted, the patient could always be readily roused by speaking to or touching him. The bowels were spontaneously moved on several occasions. There was a pulse-range from 88 on the morning of the 6th to 160 on the evening of the 16th, and a temperature-range from 98.5° F. on the morning of the 9th to 103.5° F. on the evening of the 7th.

The man died on June 20th, fourteen days after admission.

Autopsy.—On opening the abdomen, a quantity of pus, estimated at about one pint, poured out of the incision. The intestinal coils were so

firmly glued together and to the abdominal parietes that their removal was a work of great difficulty. The cæcum was sought for at once, but not readily found or removed, owing to its being covered by adherent coils of small intestine. The vermiform appendix curled round the anterior portion of the cæcum, to which it was attached for the greater portion of its length, and near its extremity was found a perforation, immediately above which a hard substance was felt, filling its calibre; a slight pressure caused this to escape from the opening, and its exit was followed by pus. The foreign body is in shape precisely like an apple-seed, although somewhat larger, and its roughened surface is formed of a dark, grayish-brown, calcareous-looking substance. The signs of peritonitis were not more marked in the neighborhood of the cæcum than elsewhere, nor was there any apparent attempt at the formation of a pericæcal abscess. Pain was never particularly referred to the right inguinal region, but always, as has been said before, to the external portion of the right hypochondriac region, and, corresponding with this, there is to be seen, on the superior surface of the right lobe of the liver, a circular patch of lymph, about three and a half inches in diameter, which was firmly adherent to the inner surface of the ribs. The surface of the liver at this point is slightly depressed, but, on section, nothing abnormal, beyond a great degree of congestion, was found. The kidneys were very unequal in size, the right being below the normal in this respect, the left above it; but the relative proportions between cortical and medullary substance in the two organs, and their color and consistence, were normal. The spleen was covered with a thick layer of lymph, and was shrunken. Two bodies, which correspond in situation with the appendices epiploicæ, being attached to the large intestine by a short mesentery, present an unusual appearance. Their surface is of a bluish-purple color, and on section their tissue is of a brownish-red hue, resembling that of the spleen. They are about the size of an ordinary marble. One of these, attached to the splenic flexure of the colon, is before the Society. No other than the abdominal organs were examined. *June 26th*, 1879.

Report of the Committee on Morbid Growths:

"A microscopic examination of the body attached to the splenic flexure of the colon shows it to have all the histological elements, and a similar arrangement of the same, as found in the normal spleen. The nodule is therefore one of those not unusual abnormalities, a supernumerary spleen." *September 11th*, 1879.

9. *Perforation of the vermiform appendix.*

Presented by Dr. J. T. Eskridge.

I am indebted to Dr. Campbell for portions of the clinical history of the following case: B. F., male, æt. 19, had always been healthy, though of costive habit, until January, 1879, when he complained of pain in his right side, which was severe enough to prevent his lying straight in bed at night; but of this he was soon relieved, and was again considered perfectly well till the early part of April, when he had a second attack of pain in the same locality. During the latter part of April, while attending a circus, he was thoroughly wet by a drenching rain, and ate largely of peanuts. About May 1st, he was heard crying, while at stool, on account of a sharp pain shooting upwards and to the right side of the belly. On the 2d and 3d he complained of soreness in the right iliac region, and was given by a druggist two doses of purgative medicine in one day, and on the 4th the cramps were worse, and he was compelled to lie in bed, but was given, by the same druggist, a tablespoonful of purgative medicine every half-hour till he had taken a large bottleful, to no effect except to aggravate the pain. May 5th, he was seen by a physician, who had his bowels opened by an enema. May 6th and 7th, he was better, went down-stairs and sat up, but there was considerable soreness in the right iliac region. He had a chill during the afternoon of May 8th, and Dr. Campbell saw him for the first time about 8 P.M. He complained of great pain near the umbilicus. The prostration was great, countenance pinched, pulse quick and wiry, and temperature 99° F. Counter-irritation was applied to the abdomen, followed by warm and moist applications, and he was given calomel, extract of opium, quinia, and rhubarb. Pain relieved by morphia. May 9th, at 9 A.M., pulse 110, temperature 100° F., and respirations 40; nausea, vomiting, and great pain; patient sinking. About noon of the same day, I saw the patient, in consultation with Dr. Campbell, and found him lying on the right side, with legs drawn up. There was moderate tenderness over the abdomen, but most marked in the right iliac region, and the right rectus muscle of the abdomen was quite tense; pulse 120, respirations 50, temperature 100° F.; incessant nausea and vomiting, and a distressing thirst. The appendix was agreed upon as the seat of trouble, and perforation was supposed to have taken place the day before. At my suggestion, an enema composed of milk and brandy, with a little laudanum, was given. At 11 P.M., felt better, wanted beer, pain gone, but

thirst continued, and he was now vomiting stercoraceous matter; pulse 160, respiration 60, temperature 99° F.; patient sinking. May 10th, chill at 5 A.M., and died one hour later. Vomited fecal matter to the last. No swelling of the stomach.

Autopsy, thirty hours after death.—The abdominal cavity only was examined. No accumulation of gas. Peritoneum highly congested, and in the right iliac region several adhesions had formed. Pus was abundant in the neighborhood of the appendix, and small deposits of the same were found in the umbilical, hypogastric, and left iliac regions. The cæcum, lower portion of the ileum, and beginning of the colon were highly congested, and the appendix, the seat of the original trouble, had undergone suppuration, and was perforated by two holes. The supposed offending substance which was thought to have given rise to the trouble in the appendix was diligently searched for in every part of the abdominal cavity, but it was not found.

The history of this case is the history of most cases of suppuration of the appendix. There may be, as there was in this case, a history of one or more previous attacks of pain in the right iliac region, but the most characteristic and interesting part of the history of suppuration of the appendix is the attack of cramps or pains in the right iliac region, lasting two or three days according to circumstances, followed by a remission or lull, and this in turn, in a day or two, is followed by a chill, great prostration, and all the evidences of general peritonitis and impending death.

If we bear in mind the usual cause of this trouble, we may in many cases, if consulted early, be able to save, or at least to prolong greatly, our patients' lives. Most foreign substances found to have given rise to perforation of the appendix have been shown to be concretions of fecal matter. I am not sure that a well-authenticated case is on record where a seed or stone of any kind has found its way into the appendix and caused suppuration and perforation. A number of such have been reported, but none of these were examined microscopically. About one year ago I had occasion to look up this matter, and I was unable to find a satisfactory example. That such a thing could never occur there is no reason for thinking. There are a number of cases reported where foreign bodies, such as pins, tacks, etc., have been found in the appendix, some giving rise to perforation, and others causing no appreciable difficulty.

In the London *Lancet* for March, 1879, Dr. Whiphan read notes of a case of perforation of the appendix cæci and of the cæcum, followed by pyæmia, empyema, and abdominal abscess. At the autopsy an ab-

scess was found in the right iliac region, and free in the cavity lay a pin, which had made its way through the cæcum and its appendix into the abdominal cavity. In the discussion which followed, Dr. Southey related a case in which perforation of the appendix was caused by a tin tack, and Mr. Hulke a case of ulceration of the cæcum caused by impaction of damson stones, but he does not state whether these stones were examined microscopically; at any rate, nothing is said of their having found their way into the appendix. On the other hand, showing the toleration of the appendix for foreign substances, in the first number of the *New York Medical Record* for 1879 a case is reported of accidental death, and at the autopsy a pin was found in the appendix, and, so far as could be ascertained, the man had never complained of pain in that region; and in one of the London medical societies, several years ago (mentioned at one of this Society's meetings, more than a year ago, by Dr. John Ashhurst, Jr.), a case was reported in which, at the autopsy, the head of a pin was found in the appendix and its point in the bladder, around which a good-sized urinary concretion had formed.

Since most of these cases of perforation of the appendix are caused by concretions of fecal matter, and since these concretions may lie in the appendix for an indefinite time without giving rise to trouble, as is often shown by their presence at autopsies, and in the dissecting-rooms, where we have nothing to lead us to suspect trouble in the appendix, we must look beyond their mere presence for an exciting cause. This I think we may attribute to the muscular action of the bowel and appendix. A fecal concretion may have lain in the appendix for years, giving rise to no irritation till the bowels are unduly excited by some foreign substance or irritated by cold, when the peristaltic-like movements may be transmitted from the bowel to the appendix, and what before was harmless now becomes an irritant as it is caught between its walls.

The treatment of these cases deserves the greatest care on the part of the most intelligent physician. In most of the cases of perforation of the appendix that I have seen, death has been caused by early, free, and heedless purgation. I have no doubt that the present case might have been saved had he fallen into the hands of an intelligent and careful physician instead of the ignorant and unscrupulous apothecary, who added greatly to his sufferings and danger by the liberal use of purgatives.

I have come to regard purgatives as powerful agents, either for weal or for woe. *June 26th*, 1879.

III.—THE VASCULAR SYSTEM.

1. *Heart with lesions of the mitral and aortic valves, from a case of death from pulmonary hyperæmia.*

Presented by Dr. Louis Starr.

I am indebted to Dr. J. Cheston Morris for the opportunity of presenting this specimen, and also for the following clinical history, the patient having been under his observation for a long time before death.

"Mary E. C., aged 34, colored, suffered from inflammatory rheumatism and endocarditis in 1870, and was admitted to the Episcopal Hospital, and treated by Dr. Morris. Recovered, returned to work, but had from time to time more or less difficulty in breathing, and rheumatic pains, for which she was under the care of Dr. Morris. She was not obliged to give up her place or to take to her bed, until a short time before her decease, when she seemed to become feeble and lose spirits, and had a severe attack of gastro-intestinal irritation, with some resemblance to typhoid fever. On Monday previous to her decease, she suffered from very acute dyspnœa; her pulse became feeble, and extremities cold; she was nearly pulseless for twenty-four to thirty-six hours before her death from pulmonary hemorrhage, on Saturday, November 2d, 1878."

The *post-mortem* examination was made forty-eight hours after death.

On elevating the sternum with the costal cartilages, so as to expose the thoracic viscera, a peculiar, red fringe of tissue was observed, tightly adherent to the fibrous layer of the pericardium, and extending from its point of attachment to the diaphragm, on either side, almost to the base of the heart. This fringe was quite firm in texture, and was about an inch in width, and a quarter of an inch in thickness along the line of attachment: the free edge was thin and irregular. Subsequent microscopical examination by Dr. Simes proved it to be nothing more than intensely congested adipose tissue. The pericardium was thickened, and contained a small quantity of serous fluid. The heart was enlarged, both ventricles being dilated, and the wall of the left slightly hypertrophied. There

was stenosis and insufficiency of the mitral valve, the orifice being funnel-shaped and narrowed so as barely to admit the tip of the index finger, while the edges of the leaflets were thickened and roughened upon their auricular surfaces. The aortic leaflets were thickened, and their under or ventricular surfaces were roughened, and covered with firmly adherent fibrinous deposits; one of these extended for an inch or more into the aorta, and interfered with the closure of the valve. The edges of the tricuspid leaflets were thicker than normal, and the pulmonary leaflets were fenestrated, but both valves were fully competent.

The lungs were in a condition of hyperæmia, especially the left, which was dark red in color, and non-crepitant except at the apex and along the anterior margin. On section, blood flowed freely from the cut surface. The liver was large and apparently fatty. The kidneys were moderately contracted. The ovaries were large and congested; the uterus was about the usual size, its tissue was pale and very dense, and connected with it by narrow peduncles were several small, very hard fibrous tumors.

In connection with this specimen, the following history of a case of cardiac disease, in which death was caused by œdema of the lungs and pericardial effusion, is of interest.

Margaret ——, æt. 78 years, a sempstress by occupation, of temperate habits, and having a healthy family record, was admitted to the Hannah Ward of the Episcopal Hospital on November 4th, 1878. Her health was good until 1870. Since then she had suffered from time to time from subacute rheumatism, associated for twelve months past with symptoms of cardiac failure. When admitted, she was in a condition of great prostration, and had constant difficulty in breathing; she had, too, a troublesome cough, attended with the expectoration of frothy mucus, occasionally streaked with blood, and she experienced frequent attacks of angina pectoris. There was no dropsy. The apex-beat of the heart was situated in the fifth intercostal space, nearly on the line of the left nipple, there was slight tenderness over the precordial region, and on auscultation two systolic murmurs were heard, one at the apex, and the other at the aortic cartilage. The physical signs of bronchial catarrh were likewise present. Death occurred on November 12th, and was preceded by greatly increased dyspnœa. Numerous small bubbling râles were heard over both lungs during the last twenty-four hours of her life. The *autopsy* was made thirty-six hours after death, by Dr. Anders, the resident physician. The thoracic cavity was examined first. The pericardial sac was distended with a straw-colored fluid. There was a large accumulation of fat about the heart, and the muscular tissue itself was

pale and flabby. All the cavities of the heart were dilated. The edge of one of the mitral leaflets was thickened and roughened, the lesion being quite sufficient to interfere with the proper closure of the valve. The aortic leaflets were increased in thickness, and much less flexible than normal; the aorta was atheromatous, particularly in the vicinity of its orifice. The tricuspid and pulmonary valves were healthy. A few patches of atheroma were observed in the wall of the pulmonary artery close to the valve. The coronary arteries were atheromatous.

There were a few moderately firm pleuritic adhesions at both apices, and at the base of the right and the posterior portion of the left lung. The basal and posterior portions of both lungs, but especially the left, were œdematous. The pulmonary tissue in these positions was reddish in color and soggy, and on section a quantity of liquid, mixed with blood and containing a few air-bubbles, escaped from the surface of the cut.

The abdominal viscera were normal, the kidneys showing no alteration but congestion. *November* 14*th*, 1878.

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2. *Enormous aneurism of thoracic aorta.*

Presented by Dr. William Pepper.

Dr. William Pepper, who had examined the patient during life, presented the specimens, with the following history, for Dr. William Savery, of Bryn Mawr:

He was 46 years old on the 22d of February last; by occupation a newspaper dealer, which business he has followed for many years on the line of the Pennsylvania Railroad.

From his boyhood he has been noted for feats of activity and endurance. His route extended as far as the town of Coatesville, and during the time when there were no Sunday trains on this road, it was his custom, in order to serve his patrons, to make an extra early start on the Sabbath, walk as far as the Paoli Hotel (nineteen miles) to breakfast, continue the journey up to Coatesville, distributing his papers on the way, dine there, and then walk back to the city in the afternoon, rising again the next morning at his usual hour, two o'clock, in order to reach the newspaper offices in good time to obtain his supplies.

Since I have known him, his constant habit of jumping on and off of trains in rapid motion has caused many a prediction among the passengers and officials that he would meet his death sooner or later from that cause.

Within the past year, however, he has been more circumspect, feeling, no doubt, his growing inability to do as he used to, though very loath to acknowledge it.

About three months ago he came to my office for professional advice, complaining of a lump in his back, which was growing rapidly, and becoming more painful than it had been when he first noticed it, five months before. On examination I found a swelling as large as the head of a child three months old, occupying the left side and back part of the chest, rising just below the inferior angle of the scapula, and extending from the vertebral column to the edge of the trunk. There was at this time no discoloration of the skin, and nothing in the appearance of the swelling to indicate positively its character.

But upon applying the hand to it there was a very decided thrill noticeable, and by the ear a further proof of its aneurismal nature was found in the characteristic murmur accompanying every beat of the heart. The facial expression of the patient was indicative of constant suffering, which a feeling of pride prompted him to conceal as much as possible. I prescribed a steady course of tincture of digitalis and tincture of iron, in moderate doses, with the use of anodynes at night to procure rest when necessary.

I also strongly advised him to change his occupation, or to abandon his present one, as the constant exertion and excitement incident to such a life must be injurious. This advice he declined to take, and continued to serve his papers until within about ten days of his death, when increasing suffering and weakness compelled him to remain in his room. In the interval I saw him a number of times, either at my office or at his own home, and found that the tumor increased rapidly in size.

The patient died quietly during sleep, on the night of the 29th ultimo, and I made the autopsy on the following evening, assisted by Drs. Hill and Smith, of Ardmore.

The body was considerably emaciated. The girth around the chest at most prominent part of tumor was forty-one and a half inches.

Heart appeared to be somewhat dilated, its color pale; the internal structure and condition not examined, as I knew you would be interested in seeing it opened, and therefore left it.

Lungs healthy; the left one considerably compressed and pushed upwards by the presence of the tumor below it; but on being removed from the chest its tissue seemed quite crepitant throughout.

Liver.—Natural in color and consistence; rather large, its weight being fully four pounds.

Spleen.—Normal in size and structure.

Kidneys.—Apparently perfect, except that the left one was adherent by a considerable portion of its capsule to the lower surface of the tumor.

Stomach, intestines, pancreas, etc., all of natural appearance.

Aorta apparently sound till its descending portion reached the fourth dorsal vertebra, where it had dilated upon the right side, forming a small tumor about the size of a hen's egg, firmly adherent to the vertebra; this was filled with a soft clot.

Lower down, about opposite the eighth dorsal vertebra, the aortic wall had given way again, forming the main tumor, which occupied the left side, extending from a point opposite the seventh rib to the kidney.

This was full of coagula, and so adherent to the vertebræ and ribs that it was impossible to remove it without tearing its walls to an extent that quite changes its appearance. About three pints of liquid blood were removed from the thoracic cavity, before displacing the tumor, but whether this had been an ante-mortem effusion from a rupture of the sac on its posterior surface, or was produced during the examination, it was difficult to determine.

The ninth, tenth, eleventh, and twelfth ribs were very much diseased, the first-named being separated about two inches from its articulation with the spine, and the others had almost disappeared from absorption and pressure by the tumor; also the corresponding vertebræ were extensively necrosed, as the specimens will show. The ninth rib continues adherent to the tumor.

The patient had syphilis in a severe form a number of years ago, which probably accounts for the origin of the fatal lesion.

January 23*d*, 1879.

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3. *Aneurism of the ascending portion of the thoracic aorta, from a case treated by rest and a restricted diet.*

Presented by Dr. Louis Starr.

James ——, æt. 41 years, a blacksmith by occupation, of temperate habits, was admitted to the medical ward of the Episcopal Hospital on November 2d, 1877. His family history was healthy. He denied ever having had venereal disease, but his statements in this respect were rather confused and probably incorrect. His health had been good until about five months before his application at the hospital, when, while working in his shop, he accidentally misplaced a heavy bar of iron, which, in fall-

ing, struck him across the breast, with a force almost sufficient to knock him down. Although none of the ribs were broken by the blow, the soft parts were considerably bruised, and he was obliged to rest for two days. Upon resuming work he began to suffer from pain, of a neuralgic character, in the upper part of the right chest, gradually becoming more severe; and six weeks later he noticed a projection of the chest-wall beneath the right clavicle, and an unnatural beating in the same position. Both the pulsation and the pain were greatly augmented by exertion, and this also caused paroxysms of coughing and dyspnœa; for this reason, as well as on the account of failing strength, he was soon obliged to give up work entirely. While he remained quiet he was comparatively comfortable, but the tumor steadily increased in size up to two weeks before he came under observation, when it seemed to stop growing.

When admitted he was weak, though in good condition as regards flesh. The eyes were suffused, the lips purple, the face dusky-red in color, the hands livid and cool, and the external jugular veins, and the superficial veins of the hands and arms, dilated and prominent. At the upper anterior portion of the right chest there was a hemispherical aneurismal tumor, measuring seven and a quarter inches transversely and eight inches in a vertical direction. The acromial extremity of the right clavicle was about an inch higher than the left, and the tumor extended from the lower edge of the bone to the fourth rib, and from the middle of the sternum to the margin of the axilla. The anterior portions of the second and third ribs at the site of the aneurism could not be felt, having evidently been eroded. The investing integument was tense, but unaltered in temperature and color. There was visible pulsation. The aneurism was firm and elastic and painless to the touch, the wall in the most prominent position was extremely thin, as if composed of little more than the skin, and a double impulse was felt, the more forcible stroke being synchronous with the cardiac impulse and attended by a uniform expansion of the sac. On auscultation two sounds were heard similar to, but louder than, those of the heart. Neither thrill nor murmur could be discovered. Percussion was dull over the whole surface of the upper third of the right chest, the liver dulness began at the usual level, and between these two regions of dulness there was a narrow band of impaired pulmonary resonance. Vesicular murmur and vocal resonance and fremitus were abolished over the upper area of dulness. The respiration on the left side was puerile. The apex-beat of the heart was situated in the fifth interspace, directly under the left nipple; there was no valvular murmur. The patient complained of occa-

sional giddiness, and of a sense of distention and dull pain in the tumor. The respiratory movements were increased in frequency, and he had paroxysms of dyspnœa and ringing, unproductive cough. The pulse was equal in both radial arteries, and was feeble and moderately frequent,—about 100 per minute. His tongue was lightly coated, his appetite poor, and his bowels constipated. His pupils were equal, there was no hoarseness or dysphagia, and the urine was normal.

Under treatment his condition improved considerably, the giddiness and the cough and dyspnœa disappearing, the complexion becoming more natural, and the circulation slower. There was, too, less pain and pulsation in the aneurism, and on manipulation there was a feeling of increasing solidity. The improvement continued until January 15th, 1878, when, without any apparent cause, the symptoms of internal hemorrhage set in, and death followed in about four hours.

Inspection.—On opening the thoracic cavity a large quantity of recently-coagulated blood was found in the right pleural sac. The blood had escaped from a ragged opening, large enough to admit the point of the index finger, in the lower part of the aneurism, and completely filled the space between it and the liver, compressing the lower lobes of the lung against the spine, and forcing the liver an inch or more downwards. The aneurism sprang from the convexity of the ascending aorta, was globular in shape, and occupied nearly the whole of the superior third of the right chest cavity, the portion in the interior of the thorax being equal in bulk to that on the exterior. The wall immediately about the position of rupture was very thin, and composed of little more than the reflected pleura; the remainder of the sac was moderately thick, and was formed by the distended arterial coats. The external wall was covered by the attenuated pectoral muscles and a layer of adipose tissue, both the wall and its coverings being thinnest at the most prominent point. The interior of the aneurismal sac was rough, and its cavity was occupied by a large, firm, non-adherent clot. This clot was laminated, the external layer was soft and recently formed, and upon the outer surface there were several small pieces of eroded bone. The lower edge of the first rib, the right border of the first piece of the sternum, the upper margin of the fourth rib, and both the sternal and vertebral extremities of the eroded second and third ribs projected into the cavity and were devoid of periosteum and roughened. The orifice of the aneurism was oval in outline, two inches and a half in length by an inch and a half in width, and was situated about an inch above the aortic valve. The aorta was atheromatous and somewhat dilated. The heart was small, the edges of

the mitral leaflets were slightly thickened, and the aortic leaflets were less flexible than usual; the other valves were healthy.

The upper lobe of the right lung was compressed between the posterior part of the aneurism and the thoracic wall; it was adherent to the former and contained several isolated collections of caseous material. The middle and lower lobes were also compressed, though to a less degree. The pleura was opaque and thickened.

The left lung presented nothing abnormal, except a few old pleuritic adhesions. The aneurism pressed upon and partially obstructed the superior vena cava, the right pulmonary artery, and the right bronchus; the rings of the latter were bent inward, and the interior of the tube contrasted markedly with that of the opposite side.

There was no disease of the abdominal viscera.

An interesting feature of this specimen is the firmness and size of the clot, which though unattached to the sac, so nearly fills it that the blood in flowing through the aneurism must have spread out into a thin, broad layer. Now, although in order to effect a cure the deposit of fibrin should have been *upon* the interior of the sac and not *free* in its cavity, the presence of such an amount of fibrin shows an effort in the right direction, that in a less hopeless case might have been successful. This effort I cannot but attribute, in part at least, to the treatment adopted, viz., absolute rest in bed, and a restricted diet, medicines being used only to regulate the bowels, and upon one or two occasions to induce sleep.

Rest, the main factor in the treatment, favors the deposition of fibrin chiefly by slowing the heart's action. That it is really a therapeutic agent of importance may be judged from a case reported by Tufnell* in which the pulse when standing and in ordinary exercise was 96 per minute, after lying horizontally for a time 66, a fall of thirty beats per minute, and supposing the patient to have remained in bed, under ordinary circumstances, twelve hours out of the twenty-four, a difference during complete rest of 21,600 pulsations a day,—a reduction of great consequence. In my case the reduction was not more than twelve beats a minute, probably because of the impossibility of maintaining anything more than a semi-recumbent position.

The object of a restricted diet is to reduce the quantity of the blood without impairing its quality, so that while over-distention of the aneurismal sac is avoided, the conditions favorable for fibrinization are preserved. The same results cannot be obtained by the old methods advo-

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* The Successful Treatment of Internal Aneurism, etc. London, 1875.

cated by Valsalva, either venesection or venesection combined with starvation; on the contrary, each of these methods of treatment would produce an anæmic condition, reduce the fibrin, and tend to quicken the circulation.

The quantity of food served in the present case was estimated by weight and measure, as follows. For breakfast, two ounces of bread and four fluidounces of milk. For dinner, four ounces of meat (beef or mutton), three ounces of bread or potatoes, and four fluidounces of water or "rice and milk." For supper, two ounces of bread and six fluidounces of milk. The aggregate, eleven ounces of solid and fourteen ounces of liquid food, would seem to be a very small allowance, were it not for the other element of the treatment, much less food being necessary in a perfectly passive state of the system than during active life. The patient complained a little at first of the restraint and enforced abstinence, but was soon reconciled by the great improvement in the symptoms.

Tufnell records nine cases of aortic aneurism treated in this way, in all of which, after an average course of about eleven weeks, a marked improvement or an apparently perfect cure resulted.

January 23*d*, 1879.

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4. *Specimens of contraction and dilatation of the orifices of the coronary arteries.*

Presented by Dr. Frederick P. Henry.

J. M., a sailor, æt. 31, was admitted to the Episcopal Hospital on March 3d, 1879. He complained of a constant pain in the chest, on the right side, anteriorly, over the second intercostal space. At times there were exacerbations, during which the pain travelled down both arms. Besides this there were complaints of steadily increasing weakness and almost nightly seminal emissions. The man was unusually well developed as to his muscular system, but his skin was sallow and dirty-looking.

When about twenty years old he was subject to convulsions, of which no definite account could be obtained, and about ten years ago (*i.e.*, when about twenty-one) had an attack of general œdema. Eight years ago he had a chancre, and three years ago he was treated in the Episcopal Hospital for facial neuralgia, and again, a year after, for intermittent fever. For the last three years he has been subject to spermatorrhœa. He knew of no cause for his last illness, unless it was exposure to wet and cold, and straining in pulling the ship's ropes.

The chest was carefully examined on more than one occasion, especially over the seat of pain, and, so far as the lungs were concerned, nothing abnormal was detected. There was a distinct aortic-systolic murmur and rapid and forcible cardiac pulsation. The urine was examined for albumen, with a negative result. Not feeling satisfied with this, I examined it microscopically, and found numerous granular casts. I examined the urine on four occasions without finding albumen, but on none of these were casts absent. This, I need scarcely remark, is very exceptional. At the last examination the urine was found to contain numerous spermatozoa. The patient grew steadily weaker, and the pain beneath the second intercostal space remained constant, while the paroxysms of angina became more frequent.

On April 12th, 1 P.M., there was orthopnœa; pulse 140; respiration 40; with an expectoration of a thin, almost serous, light coffee-colored sputum, on the surface of which floated a beer-like froth. In the course of an hour he expectorated nearly six ounces of this material. An inhalation of five drops of nitrite of amyl had the effect of increasing the cough without mitigating the pain or dyspnœa. The man died the same evening.

The *autopsy* was made twenty-eight hours after death. Rigor mortis was very marked; the pericardial sac contained about two ounces of serum; the veins upon the surface of the heart were distended with blood; the cavities of the heart contained fluid blood,—in greater quantity on the right side; the pleural surfaces of the right lung were united by a strong band of adhesion, which began in the second interspace about an inch from the right border of the sternum, and, following the direction of the interspace, passed upward and outward, to terminate on the postero-lateral surface of the lung, a little below the apex. This band of adhesion at its widest portion (the centre) was about two inches in diameter. It will be observed that this adhesion was directly beneath that portion of the chest-wall where, during life, the patient complained the most of pain. The lung beneath the adhesion was healthy, as well as throughout the rest of its extent; the left lung was entirely free from adhesions, and perfectly healthy; the walls of the heart were pale, flabby, and almost fawn-colored, but of normal thickness; the cavities of both sides were somewhat dilated; the weight of the heart, with about two inches of the aorta, was fourteen and a quarter ounces; the internal surface of this portion of the aorta was elevated in uneven ridges, no portion of the intima appearing free from disease, this roughening of the surface being most marked about an inch from the aortic valves. The mouths of the

coronary arteries were constricted almost to the point of occlusion. The kidneys were decidedly granular, which condition gives rise to the question whether the general œdema from which the patient suffered, ten years ago, was due to an acute parenchymatous nephritis, recovered from but followed by the chronic interstitial inflammation. The right kidney weighed three and one-half ounces; the left, four and one-quarter. In the latter a cyst, the size of a large pea, was found near the upper end of the posterior surface. On removing the capsules, portions of cortical substances adhered to them.

Specimen No. II., that of dilatation of the coronary orifices, was removed from the body of a colored man, æt. 49. I have been unable to obtain a complete history of the case. He was admitted to the Episcopal Hospital on February 13th, 1879, and when he came under my care was suffering with the symptoms of combined heart and kidney disease in their last stages. Most prominent among these were universal anasarca and ascites. The heart's action was feeble and its sounds muffled, but unaccompanied by murmur. The urine contained albumen in moderate quantity and a great number of highly-granular casts: these were so numerous that, in the specimen examined, on moving the slide about, there was always at least one cast to be seen in the field of the microscope. The man died on April 15th, 1879, from increasing dropsy and gradual failure of the heart's action.

At the *autopsy* the mitral valves were found to be slightly thickened, but apparently competent. The left ventricle was filled with a large currant-jelly-like clot. A large patch of atheroma, about the size of a Lima bean, was found on the internal surface of the auricle, just above the larger leaflet of the mitral. The left ventricle was dilated and its walls hypertrophied; the left auricle was also dilated. The cavity of the right ventricle was not dilated, nor were its walls hypertrophied; contrasted with the hypertrophied left side, it even appears smaller than normal. The right auricle was dilated; the valves of the right side were in no way affected; the aortic valves were competent. The internal surface of the aorta, just above the valves, was the seat of extensive atheroma, which continues for three inches upward,—that being the extent of the artery examined. The orifice of the left coronary artery was greatly dilated, being the size of a three-cent piece; the right coronary was also dilated, but not to the same extent. Both these vessels were given off at a higher point than usual, especially the left one, which arose about three-fourths of an inch above the free border of the semilunar valves. The aorta itself was greatly dilated, its circumference measuring three

inches and three-fourths. The heart, with three inches of aorta, weighed twenty-two ounces. The kidneys were intensely congested, dark blood flowing freely from them on section. The left one weighed six ounces; the right, a trifle under six. The liver was somewhat stained with bile, but otherwise healthy. The lungs were œdematous, and there were pleuritic adhesions on both sides, more extensive on the left.

In neither of the two specimens do the coronary arteries present the sole or even the most conspicuous lesion, but in one of them (that with contracted coronary orifice) all will admit that, in its effect upon the heart, it is probably the most important pathological change; and I hope to be able to show that it is at least probable that this is also the case with the other specimen,—that with dilated coronary orifice. In the specimen of contracted orifice the most conspicuous change is a very great degree of chronic endarteritis; there is also some cardiac hypertrophy, the heart weighing over fourteen ounces. In the other specimen the cardiac hypertrophy is much greater, the heart alone probably weighing over twenty ounces. The valves appear to be competent, and in neither case was there a *valvular* murmur. In Case I. there was a murmur, and a very distinct one, but it was undoubtedly caused by the great roughening of the aortic intima.

These specimens appear to me to possess a great degree of interest in connection with the etiology of cardiac hypertrophy. The circulation in the coronary arteries is generally looked upon as exceptional, in that it occurs during the cardiac diastole. It is supposed that this is due to the fact that during the heart's contraction the pressure upon the blood-vessels ramifying in its substance is too great to permit of circulation. Doubtless this is true, but a moment's reflection will show that throughout the body the circulation is most active during diastole. This is plainly demonstrated by the sphygmograph. The pulse is synchronous (or nearly so) with the systole, and the pulse is produced by a wave motion, a distention of the artery; and the portion of the sphygmographic tracing that corresponds to the pulse is an almost vertical line. As we approach the heart this line becomes more and more vertical,—that is to say, the onward movement of the blood becomes less and less during systole, until finally, in the coronary arteries, there is no onward movement whatever at that time, and the circulation is altogether diastolic.

It is evident that, other things being equal, the activity of the coronary circulation is in direct proportion to the degree of aortic tension. If, as in Case I., the coronary arteries, from disease of their orifices, fail to yield to the aortic tension, compensatory hypertrophy cannot take place,

and speedy death ensues. On the other hand, if the coronary arteries yield too readily to the aortic pressure, the hypertrophy progresses too rapidly, its limit is soon reached, and dilatation and degeneration, with their attendant dropsy, are soon followed by a gradual failure of the heart's action. There is a limit between these points, and it is conceivable that in some cases a moderate amount of aortic regurgitation might be conservative. In Case II. there does not appear to be sufficient cause for the great degree of cardiac hypertrophy; the gross appearances of the kidney are not those of cirrhosis, but rather of the form of renal disease that is usually found with cardiac valvular disease, which has been denominated cyanotic induration. An undue supply of blood to the heart from relaxation of the coronary vessels cannot well be excluded from an attempt to explain the hypertrophy present, and this renders the case one of great interest. *May* 22*d*, 1879.

IV.—THE ORGANS OF RESPIRATION.

1. *Report of several cases of tumors in the larynx.*

By Dr. Carl Seiler.

These cases are reported not because tumors in the larynx are uncommon, but because they show some remarkable features not often met with, and also because they demonstrate the necessity of a careful laryngoscopic examination in all cases of partial or complete aphonia.

Case I.—Mrs. B., æt. 32, applied to me for a stubborn hoarseness which had been annoying her for the last two years. Her voice was hoarse, both in singing and speaking, but to no very great degree, and before I had made an examination of the larynx I was convinced that the case was one of unilateral paralysis of the vocal cords. She had been under the care of several physicians, and had taken large quantities of cough syrups and tonics. A laryngoscopic examination showed a small nodule on or in the free edge of the left vocal cord, projecting slightly into the glottis. The right vocal cord was notched in its free edge at a point opposite the nodule in the left cord; both the nodule and the notch being at about the middle of the length of the cords. In phonation a complete closure of the glottis took place, the nodule fitting into the notch, but an unequal vibration of the cords could be observed. The right cord was slightly reddened, while the left was normal in color. The tumor being imbedded in the substance of the cord, and too small for instrumental interference, I endeavored to absorb it by applications of strong solutions of nitrate of silver,—eighty grains to the ounce. After two months, the silver having been applied daily, the voice had assumed its natural tone, and the cords appeared perfectly normal.

Case II.—George G., æt. 52, a laborer, presented himself at the dispensary for diseases of the throat at the University Hospital, complaining of complete loss of voice for eighteen months. His family history was not good, his father and one brother having died of phthisis, and he had been losing flesh for some time past. A physical examination of the chest revealed no lung affection. On laryngoscopic examination, a nodule

of the size of a mustard-seed was found to be imbedded in the edge of the left vocal cord, which was also paralyzed, failing to meet its fellow on attempted vocalization in the median line. The larynx appeared otherwise normal. Absorption by nitrate of silver was again decided upon, first by solutions and then in the solid form melted on to the end of a silver probe, but without apparent success, the applications having been kept up for six weeks daily.

The general health of the patient was, however, very materially improved, he having gained several pounds in weight. His larynx by that time had become so tolerant to the sound or brush that I was induced to try electrolysis in order to cause an absorption of the growth. For this purpose I attached a needle to the end of a laryngeal rheotrope, and succeeded, after a few trials, in imbedding its point into the tumor. The other pole was placed on the neck opposite the larynx, and the current from twenty small zinc cells was passed through the growth, which had the effect of heating the point of the needle to a high temperature, which was shown by the change of color of the steel. The current was kept passing for about thirty seconds, and the rheotrope was then removed. The vocal cord, when seen the next day, was considerably inflamed and swollen; not more so, however, than might have been expected. This inflammation disappeared in a few days, and the nodule was seen to be very much reduced in size. The nitrate of silver applications were then resumed, and the growth disappeared entirely in two weeks after the introduction of the needle. The voice was, however, only partly restored, as the paralysis of the cord remained, although not as complete as before. The treatment could not be followed up, as the patient was unable to remain in the city any longer.

Case III.—Miss S., æt. 21, applied at my office for a partial failing of her voice. She told me that in singing it had of late become impossible for her to reach and hold the higher notes, and that her throat felt fatigued after very little singing or talking. A slight huskiness was observed also in the lower notes. She complained of no pain or any symptoms of throat disease, except a slight increase in the mucous discharges, especially in the morning. On laryngoscopic examination the pharynx was seen to be in a state of subacute inflammation, and the mucous membrane of the larynx congested. The vocal cords were reddened, and on the edge of the right cord near the middle a slight elevation or nodule of the size and shape of a pin's head was observed. This produced a slight separation of the vibrating edges of the cords in vocalization, and explained the symptoms.

Absorption by nitrate of silver was again resorted to, and the growth disappeared very rapidly, so that after two weeks nothing could be seen of it, while the voice had regained its former clearness and vigor also in the upper notes of the scale.

Case IV.—This case I saw in consultation with Dr. Yocum, who asked me to make a laryngoscopic examination on a Mrs. P., one of his patients, who complained of hoarseness and of failing of the voice, she being a professional singer.

The examination revealed two nodules on the edge of the right vocal cord, projecting slightly into the glottis, and preventing a close approximation of the edges of the cords in vocalization. The growths being too small for operative interference, I advised the use of nitrate of silver, which was employed in the form of inhalations by the steam atomizer, as topical applications of the reagent were impracticable. Under this treatment the hoarseness gradually disappeared, but has lately returned, the inhalations having been given up by the patient. Unfortunately, I could not obtain another laryngoscopic inspection, and can therefore not state as to the amount of absorption produced by the inhalations.

This class of neoplasms, imbedded in the tissue of the cords, is to my knowledge very rare, and in looking over the literature on the subject but very few cases are reported. Prof. Türk mentions eight cases, and Dr. Lefferts, of New York, in a recent article in the *Medical Record*, mentions two cases, all occurring in professional singers. Of the four cases described above, three occurred in the larynx of singers, and but one in a laborer. As to the nature of the neoplasms it is rather difficult to form an opinion, as they cannot be subjected to a microscopical examination; but from the fact that they are almost exclusively found in singers, and that they yield readily to the applications of silver, it is highly probable that they are the result of an inflammatory process localized as a hyperplasia in the submucous tissue of the cords.

A case of tumor in the larynx exhibiting marked peculiarities in regard to the position of the tumor and the effect of its presence upon the voice of the patient may be described as follows:

Case V.—Mr. A., æt. 24, a student of elocution, applied to me for the cure of a peculiar huskiness in his voice, which interfered markedly with his exercises in elocution. He said that he had noticed this hoarseness for several years back, but of late it had become worse. He complained also of dryness in the throat, copious expectoration of mucus, especially in the morning, and of frequent frontal headache.

On examination, the mucous membrane of the pharynx was found to

be injected and granular, the congestion extending upward into the posterior nares, where a small abrasion, near the opening of the Eustachian tube, on the left side, was noticed with the rhinoscope.

A laryngoscopic examination revealed at a glance the cause of the hoarseness. A bright-red tumor, the size of a small French pea, was seen to be situated on the surface of the right vocal cord, a little anterior to its middle. The tumor did not project over the edge, which was slightly drawn in at the seat of the growth. The right cord was also slightly congested, while the left was perfectly normal. On vocalization the glottis was closed, with the exception of a small slit-like opening opposite the tumor, and a difference in the rapidity of vibration of the two cords could plainly be observed, causing the peculiar character of the voice. In an attempt to sing a low note (the patient having, as he told me, a bass voice) the affected cord utterly refused to vibrate, and no sound was emitted from the larynx. I decided at once to remove the tumor by means of a laryngeal forceps, and, as the patient's fauces were very tolerant to the presence of the laryngeal mirror, it was deemed an easy matter to seize the growth. On introducing the instrument, however, I found that the ventricular bands or false vocal cords closed at the approach of the forceps, completely obstructing the view of the glottis. After several weeks of daily practising on the patient, I finally succeeded in grasping the growth in the blades of the forceps and removing it. There was hardly any hemorrhage following the operation, and the subsequent inflammation was very slight. Immediately after the removal of the tumor the voice became considerably clearer, and the patient was able to sing several tones lower than he could before. The wound was treated for a few days with nitrate of silver, until it was completely healed, when the congestion of the cord disappeared, and the voice became perfectly clear. It was much more difficult to take hold of this growth than I had anticipated, not only on account of the approximation of the ventricular bands, but also because the tumor was attached with a broad base upon the surface of the cord.

The tumor proved to be, on microscopic examination, a fibro-cellular growth.

Case VI.—James M., æt. 12, was sent to the University Hospital suffering from dyspnœa and loss of voice. Dr. W. Pepper, on examining the case, discovered, by means of the laryngoscope, a large papillomatous growth filling the cavity of the larynx almost completely, and leaving but a small triangular opening, through which the air rushed with a whistling noise. Dr. Pepper at once decided to remove the growth with Mac-

kenzie's laryngeal forceps, and succeeded in tearing off several pieces, which gave the patient slight relief for a few hours. The case was then handed over to me, and I removed several pieces every day for several weeks. It was impossible to continue the sittings beyond a few minutes at a time, on account of the feebleness of the patient, due to the want of oxidation of his blood. All this time I noticed that the tumor did not decrease in size, but rather grew larger, and gradually encroached upon the small breathing-hole. Being obliged to be absent from the city for a few days, I asked my friend Dr. J. S. Cohen to operate for me, and he also removed several pieces from the growth, with but temporary relief, and I found the tumor larger on my return. By this time the difficulty of breathing had become so great that it was deemed advisable to perform tracheotomy. This was successfully done by Dr. J. Ashhurst, Jr., and the patient rapidly gained strength, the wound healing satisfactorily. Two weeks after the operation the attempts at removing the tumor were again taken up, and, as it seemed, with great success; piece after piece was removed, and the growth seemed to diminish in size, while the voice became stronger. Suddenly, however, the tumor again began to grow more rapidly than before, and could not be reduced by the forceps. Strong nitric acid was then brushed over its surface, with no better result, as it continued to grow.

The patient being desirous of returning home, and feeling very comfortable with the tracheotomy tube in his trachea, he was allowed to leave the hospital, with the understanding that he should return at some future time, when I intend to open the larynx and remove the tumor.

The remarkable feature of this case is the very rapid growth of the neoplasm, which proved on microscopic examination to be a papilloma.

October 24th, 1878.

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2. *Intra-thoracic tumor secondary to an osteo-sarcoma of the right thigh.*

Presented by Dr. Louis Starr.

This specimen was obtained after death from the same patient from whom Dr. John Ashhurst, Jr., removed an osteo-sarcoma of the right femur by a hip-joint amputation on February 28th, 1877. The latter specimen was presented to the Society by Dr. Ashhurst on March 8th, 1877.* The

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* Transactions of Path. Soc. of Phila., vol. vii. page 11.

following is the medical history of the case, taken from the ward notes of Dr. D. J. M. Miller, resident physician:

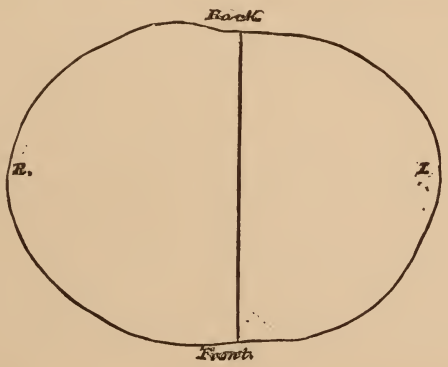
John ——, æt. 24 years, a carpet-weaver, of temperate habits, was admitted to the medical ward of the Episcopal Hospital on December 11th, 1878. All of his immediate family were living and in good health, except one brother, who was suffering with a chronic affection of the lungs. He had never had syphilis. His general health had been good before the appearance of the tumor above the right knee early in 1876, and after the amputation, until about the 15th of October, 1878. At this date he began to fail in flesh and strength, had pain in the upper part of the right chest, an irritating cough with mucous expectoration, and slight hectic fever. His weight before the onset of these symptoms was 140 pounds. On admission he weighed 128 pounds. He complained of weakness and of palpitation of the heart and dyspnœa on exertion. There was considerable pallor of the surface. His tongue was lightly coated, he had little appetite, there were frequent eructations of flatus, and he was annoyed with cardialgia, and occasionally experienced difficulty in swallowing, the food appearing to meet with obstruction before it reached the stomach. There was no regurgitation of food or vomiting, and the bowels were regular. The abdomen was moderately distended, and was tympanitic on percussion. The lower margin of the right lobe of the liver extended, in the mammary line, about two inches below the costal border, the left lobe was also displaced downward; the portion of the liver accessible to palpation felt perfectly smooth and normal. There was some cough and a scanty mucous expectoration; the cough was most troublesome when lying on the back. An examination of the chest disclosed the following conditions:

Centre of the lower part of the sternum half an inch to the left of the median line.

Right side.—Slight retraction of the infra-mammary region; intercostal spaces effaced, but not bulging; a little less expansion on deep inspiration than on opposite side; semi-circumference on the level of sixth rib, anteriorly, nineteen inches. Percussion tympanitic in first intercostal space anteriorly, and above the spine of the scapula posteriorly, entire flatness and want of elasticity over the remainder of the lung. Feeble respiratory murmur under clavicle, distant tubular respiration in upper part of axillary region, and marked tubular respiration along the vertebral gutter, loudest near the apex, and disappearing at the seventh rib; breath-sounds inaudible over the rest of the lung. Faint friction-sounds at the base posteriorly; very loud friction-sounds, accompanying both

respiratory acts, over the whole of the lateral and anterior surfaces, attended near the base of the chest, antero-laterally, by very rasping friction fremitus, the latter perceptible to the patient. Vocal fremitus absent over the area of flatness, and vocal resonance reedy.

Left side.—Semi-circumference at sixth rib eighteen inches. Apex-beat of heart in fifth interspace two inches to the left of the nipple; no cardiac murmur. Some dulness on percussion over the lower portion of the lung in front, attributed to the left lobe of the liver. The difference in the shape of the two sides of the chest is shown by the accompanying cyrtometric tracing, taken on the level of the sixth rib, anteriorly.



The pulse counted 92 beats per minute, and was moderately strong. Sleep was disturbed by the cough. The urine was voided freely, was acid in reaction, had a sp. gr. of 1.028, and contained no abnormal ingredients. There was no change in his symptoms until December 26th, when he had an attack of vomiting, followed, on the 27th, by diarrhœa. He left the hospital on December 28th. After this the prostration, emaciation, cough, and dyspnœa steadily increased, and death occurred on January 30th, 1879, being preceded for an hour and a half by severe orthopnœa.

The *post-mortem* examination was made on February 2d, in the presence of Dr. S. F. Hazlehurst, and of Dr. J. H. Grove, who had charge of the patient after he left the hospital. The body was much emaciated. Upon removing the sternum and costal cartilages, the right side of the chest was found to be filled by a tumor. This extended from the apex of the chest to a plane on a level with the tenth rib laterally; its left edge was situated one inch beyond the left margin of the sternum, and when the hand was passed along the left side, a deep groove was

felt which accommodated the right side of the heart and ascending aorta; behind this groove, towards the lower part of the tumor, there was a spherical nodule, as large as an ordinary orange, extending over the vertebral column. The heart was displaced to the left. The diaphragm and liver were forced downward. The whole of the liver was visible below the costal border, and there was a deep depression on the superior surface of the right lobe corresponding to the convex base of the tumor. The œsophagus occupied a position behind the spherical nodule, and it was probably pressure from this that had occasioned the obstruction in swallowing. The tumor was removed with difficulty, as it was necessary to tear away the costal pleura, and as the diaphragm was adherent to its base, and the pericardium to its left side. It weighed ten pounds and a quarter, was nodular, firm in texture, and conical in shape; on making an incision the scalpel grated against numerous small calcareous nodules, and the surfaces of the cut were somewhat rough, and white in color. Several large calcareous masses were found in the growth, the largest, three inches in length by an inch in thickness, being situated posteriorly near the left side. The costal pleura was adherent to the tumor, but could be stripped away by using a little care and force, leaving a roughened surface. The right lung was situated at the upper posterior part of the tumor, and was very much compressed, measuring half an inch in thickness, six inches in length, and four in breadth; the pulmonary tissue was soggy and scarcely recognizable; the right bronchus and pulmonary vessels were still patulous. The anterior surface of the compressed lung, and the new growth, seemed to be intimately connected. There was a shallow sac containing about two fluidounces of clear, serous fluid behind the lung, formed by the pulmonary and costal pleuræ; the interior of this sac was covered with shreds of lymph. Several small calcareous nodules were found in the lung. The left lung was collapsed, the lower lobe was congested, and contained, near its upper portion, two calcareous nodules as large as filberts; there was no other alteration. The heart was healthy. The mesenteric glands were somewhat enlarged, the liver and kidneys were congested, and the spleen about twice its usual size; otherwise the abdominal viscera were normal.

A microscopic examination of the tumor was made by Dr. Simes, who reports as follows:

"From thin sections, taken from different parts of the new formation occupying the right thoracic cavity, and examined microscopically, the following elements and arrangements were seen:

"The greater part of the various sections consisted of large nucleated

spindle-shaped cells, arranged in such a manner as to form alveolar spaces in which were large, round cells. In some places were seen alveolar spaces limited by a fibrillar connective-tissue wall; within these spaces, and partially filling them, were found large distinctly epithelioid cells, and granular débris. Here and there, in some of the sections, were observed large oval or irregular-shaped cells, apparently encapsulated, and surrounded by a hyaline or slightly granular substance. Other points showed a distinctly granular fundamental substance, in which were seen small imperfect lacunar spaces, with radiating canaliculi.

"From this examination I would consider the new formation to be a spindle-cell sarcoma developed in the lung, as shown by the remains of the alveoli, in which there has been a proliferation of the endothelial lining (catarrhal pneumonia). The examination would also indicate a cartilaginous, calcareous, and perhaps osseous transformation in some portions of the neoplasm.

"At the request of Dr. S. W. Gross, I made a microscopical examination of the primary tumor of the thigh, removed twenty-three months previous to the patient's death by Dr. John Ashhurst, Jr. The section examined was obtained by cutting open the tumor and removing a piece from the centre of the growth. It presented the characters of a spindle-cell sarcoma, with ossifying points,—that is, consisting of large nucleated spindle-shaped cells, round cells, and points of imperfectly developed osseous tissue."

Dr. S. W. Gross said, the specimen which had just been presented was of special interest to him, as he saw the patient from whom it was removed several months before his limb was amputated by Dr. Ashhurst, when, from the situation, consistence, and mode of growth of the primary tumor and the age of the patient, he diagnosed it as a periosteal spindle-celled sarcoma. From the minute examination made by Dr. Simes, however, it appears to belong to the variety of sarcomas termed osteoid, and that it was really of that nature is proved by the fact that the huge metastatic growth of the lung contained ossific plates. The case is, moreover, of great value in confirming a statement, which was based upon a critical study of sarcomas of peripheral origin, and was made by him a few weeks since in a course of lectures on morbid growths, delivered in the upper hall, to the effect that the periosteal sarcomas of the long bones, whether composed purely of spindle cells or of round cells, or of either of these elements combined with calcification or ossification of the intercellular substance, are more malignant by nearly fifty per cent. than are the sarcomas which start from the medulla. Of the

spindle-celled tumors, all terminate, sooner or later, by metastasis, and in one-half of all instances there are likewise local recurrences; of the round-celled, sixty-six per cent. die in the same way, while sixteen per cent. live with recurrence, and sixteen per cent. survive for forty months, apparently free from disease; while of the osteoid variety, sixty-eight per cent. succumb from visceral growths, with local recurrence in nearly one-half, eight per cent. die of repeated recurrences, and twenty-four per cent. live for a period which varies from several weeks to twenty years, or for fifty-eight months on an average. Of the entire number,—that is, of forty-four cases,—six ran a natural course, and on death metastatic tumors were found in four; eight survived operation, but one had a recurrent growth; one was fatal from septicæmia six days after operation, but there were no visceral complications; while twenty-seven died from metastasis, and two from local recurrence of the disease. Hence malignity, as denoted by local returns and general dissemination of the disease, is not within seventy-seven per cent. of the periosteal sarcomas.

Dr. John Ashhurst, Jr., said that he could add but little to the very full clinical history given by Dr. Starr. Dr. Ashhurst had, however, seen the patient at various intervals between the dates of the operation and of the beginning of his last illness, and was thus enabled to fix the time at which the symptoms of an intra-thoracic growth were first manifested, as having been not more than three, or at most four, months before death. The convalescence after the operation had been rapid and complete, and there was at no time any recurrence of disease in the stump. The duration of life had been twenty-three months after the amputation, and thirty-seven months from the first development of the primary tumor.

Dr. S. W. Gross said, in regard to the metastasis of ossifying tumors, that he thought these growths reproduce themselves, because the juices taken up contained the calcareous salts, and it seemed probable to him that they were absorbed while the tumor was developing, and carried to the lung, where they remained dormant for a time.

Dr. Ashhurst said that there were mechanical difficulties in the way of applying Dr. Gross's theory of the propagation of tumors by the absorption of bone-salts, in a state of solution, to a case such as that before the Society. It was easy to understand that a more or less minute fragment of a primary growth might be broken off and carried by the circulation to another part by the process of embolism, and several cases were on record in which this occurrence had been observed; but if centres of disease were to be carried in a state of solution through the blood-ves-

sels, it would be natural to expect that multiple growths would result, and not a single tumor, or tumors confined to a single locality. In fact, while we could in many cases trace the propagation of morbid growths through the lymphatic system (as in carcinoma), and in some few instances through an embolic process, Dr. Ashhurst thought that there was still a large proportion of cases in which, though the occurrence of secondary growths was obvious, yet the mechanism of their formation must continue to remain in obscurity. In the present case, if the intra-thoracic tumor was the result of any mechanical infection from the primary growth, it must have originated before the date of operation, and then have remained absolutely latent for more than a year and a half, since the original tumor was entirely removed, and there had been no recurrence whatever in the stump or in its vicinity. *February 13th*, 1879.

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3. *Gangrene of the lung from embolism (?) following puerperal convulsions.*

Presented by Dr. De F. Willard.

Mrs. K., æt. 20, seven months pregnant with her first child, applied to me, complaining of severe headache, accompanied with swelling of hands, face, and feet. I found that the pains in her head were accompanied by dizzy sensations, and that she frequently snored at night. The œdema of face was most marked in the morning, but during the day it almost entirely disappeared. Her appetite was good; her bowels regular; but her sleep was unrefreshing. Her strength and general condition, however, seemed good. I found her urine albuminous to the extent of one-half the bulk, and to contain a few large fatty casts.

On the following day, before I had time to put her under treatment, after having complained rather more than usual of her head, but while otherwise feeling perfectly well, and after a hearty dinner and supper, she suddenly, at 10½ P.M., fell over in a convulsion, from which she roused in about five minutes, but in half an hour had another. Saw her after the second. Was sleeping, but could be roused. Soon had a third; was accompanied by extreme jerking of muscles of face, arms, and legs; mouth drawn to one side; slight frothing at the mouth; pulse 130; pupils dilated, but movable; breathing stertorous for fifteen minutes succeeding spasm, which lasted for three minutes.

Administered forty grains chloral, which was vomited; repeated it

in ten minutes, and was retained. In one hour gave twenty grains more, and thereafter every two hours. A drop of croton oil to be given every hour. She roused sufficiently only to say that her head ached, but no convulsions appearing for three hours, I left her. The os was flaccid, and would admit easily one finger. In half an hour afterwards the fourth convulsion occurred, followed by others, to the extent of thirteen in the next three hours, her consciousness never returning between them.

When next seen, her pulse was 170, feeble; skin hot; pupils responding to light; breathing stertorous; entirely incapable of being roused to consciousness; neck of uterus now obliterated, and two fingers could be slightly separated in os; uterine contractions evidenced by facial expression and by bulging of membranes; vagina moist. Had an exceedingly severe convulsion while making the examination, and, with Dr. Curtin's assistance, I at once administered ether to remove all possible sources of irritation, opened the os in twenty-five minutes with Barnes's dilators, and instrumentally delivered a three and three-quarter pound child, which, after long efforts, was made to breathe, and at time of writing is four months old, and is growing nicely.

Not two ounces of blood was lost during the operation, the placenta being even pale. She had no convulsions during the time of delivery, and none subsequently. She remained all day, however, entirely unconscious, giving no heed to all attempts at rousing. The pupils responded readily to light, and she could swallow, but her urine was passed unconsciously. She had now taken five drops of croton oil, and had had two large injections of assafœtida and turpentine, but no passage of the bowels had been secured. Her neck had also been blistered.

Next morning, pulse 160, feeble; still unconscious; face bloated; lips and tongue swollen and bloody; pupils normal. Hair has been cut short, and bladders of ice constantly applied. A large injection gave small fecal stool; three pints of dark, highly albuminous urine, drawn by catheter, contained bloody and fatty casts in small number. Moans, but does not answer questions; sleeps restlessly. At 5 P.M., pulse 140; seems to hear, and, when fully roused, occasionally will articulate slowly, "yes." 11 P.M., pulse 130; eyes clearer; skin soft; tongue moist; and now, thirty-six hours after delivery, seems quite intelligent, but unwilling to be disturbed. Ice discontinued. Has been drinking freely of solution of Rochelle salts and of milk. The seventh drop of croton oil has now operated the third time. Has been taking potass. bromid. every two hours in camphor-water.

Everything progressed nicely, her secretion of milk appearing naturally, her whole condition indicating a speedy convalescence, until fourth day,

when a severe pain, soon accompanied by friction-sound and impaired respiration, indicated a pleurisy of left side, over lower lobe. Slight effusion evident next morning, and during day in spite of cups and appropriate treatment of yesterday, progressed rapidly to severe form of pleuro-pneumonia, the entire left lower lobe being implicated before night.

Over the lower portion of the chest there was almost complete dulness at first, owing to the slight effusion there present, but at end of week, when seen in consultation with Dr. Curtin, no liquid could be discovered, but the resonance was merely diminished over the whole lung, except in axillary and infra-axillary regions, extending from nipple to scapula, where it was flat; the vocal fremitus and resonance were lost, as well as the vesicular murmur; vocal fremitus and resonance increased over the rest of the lung, and broncho-vesicular breathing, with coarse and fine bubbling râles, everywhere present. Mobility of left side diminished; intercostal spaces apparently normal; apex-beat of heart in normal position. Right side abnormally resonant; respiratory murmur exaggerated; mobility increased.

In a few days her expectoration became exceedingly offensive, and whenever she coughed the room was almost unbearable. The odor was a peculiar one, and was so marked that it was noticeable upon entering the front door, a strange, sweetish characteristic being most evident. In fact, this smell was so marked that months subsequently, and twenty-four hours after handling the specimen, I recognized its existence as an emanation from my hands.

She emaciated rapidly, the crepitus of pneumonia giving way to subcrepitant and these to coarser râles, until all the physical signs, as well as the persistent cough and expectoration, indicated the rapid dissolution of the lung, and in the fifth week she died, albumen and casts having slowly disappeared from her urine.

Autopsy, ten hours after death.—Kidneys large, fatty; pyramids congested; other organs, save lung, healthy; uterus well reduced in size. By percussing the chest, amphoric resonance was elicited over position of former flatness; resonance as elsewhere stated. Left pleural surfaces so firmly adherent as to be only removable by tearing away with fingers, at some points the parietal subserous connective tissue giving way before the union of the two layers would yield; no liquid effusion, but at upper posterior portion of lower lobe the thin wall of a large abscess gave way, giving vent to several ounces of dark-yellow, excessively offensive pus. The lung was everywhere consolidated, and throughout its entire extent

were little depots of pus and of tissue, in various stages of decomposition.

The point above alluded to, however, was the only one at which a large cavity existed.

Dr. Willard remarked that he had detailed the case at length, as it presented several different points of interest. 1st. Pathologically considered, as to whether this pneumonia was embolic in its character, such emboli being the result of the conditions of the blood previous, during, or subsequent to the convulsions. He was strongly of the opinion that it was of this nature, although the wetting of the bed with the ice, and the occurrence of pleurisy antecedent to the pneumonia, would favor the idea of its production by cold. On the other hand, pneumonia is a very common occurrence in the course of Bright's disease. 2d. The case was of interest from the fact that chloral failed to arrest the convulsions, and in his experience such was frequently the case. 3d. It was the first time that he had been able to deliver a living infant, after such severe spasms, in the seventh month. *February* 13*th*, 1879.

V.—THE GENITO-URINARY ORGANS.

a. KIDNEYS, BLADDER, ETC.

1. *Kidney from a case of phthisis, showing dilatation of the pelvis and calyxes, and supposed secondary tubercular deposits.*

Presented by Dr. Louis Starr.

C. S., æt. 29, a sailor, died in my ward at the Episcopal Hospital, on October 12th, from catarrhal phthisis. Several months before coming under my care he had suffered with cystitis, for which disease he had been treated in the surgical ward of the hospital.

When admitted to the medical ward he presented all the ordinary rational symptoms and physical signs of advanced phthisis. His urine was examined, though there were no symptoms directing attention particularly to the kidneys or bladder, and found to be of low specific gravity, 1012, and to contain a small amount of albumen. The autopsy was made nine hours after death. On opening the thoracic cavity the lungs were found to be bound to the chest-walls by numerous pleuritic adhesions. The upper lobes of both lungs contained large cavities, while the remainder of the pulmonary tissue was infiltrated with caseous material. The heart was normal in size, its muscular tissue was pale and somewhat flaccid, and one leaflet of each of the semilunar valves was fenestrated. The liver was large and fatty. The kidneys were quite different in appearance. The left was slightly enlarged, and presented the gross characteristics of the "large white kidney." The right was also larger than normal, and had a lobulated appearance externally; on section this lobulation was found to be due to saccular dilatation of the pelvis and calyxes, the various sacs being filled with a turbid, urinous fluid, and having thick walls. The largest sac, nearly an inch in diameter, was situated in the lower part of the kidney, and approached very near the external surface, leaving only a thin layer of condensed leather-like renal tissue. The glandular structure of the rest of the kidney was not reduced in thickness, but was much firmer than normal, felt rough to the finger, and was studded with little nodules, which to the unaided

eye appeared to be collections of miliary tubercles. In removing the kidney the ureter was torn off a short distance from the organ; the tube in this position was moderately dilated, and its wall was thickened and friable. The mucous membrane of the bladder was thickened and rough and was covered with tenacious mucus; on the peritoneal surface a large number of small nodules, about as large as split peas, were observed. Similar nodules were also found on the intestinal peritoneum.

October 24th, 1878.

Report of the Committee on Morbid Growths:

"A microscopical examination of a section of the kidney presented by Dr. Starr shows the glandular part of the organ to be very much altered; the tubules are to a great extent deprived of their cells, and surrounded by fibrillar connective tissue in a state of proliferation. The capsules of the Malpighian bodies present a similar arrangement of structure. The miliary nodules scattered throughout the organ consist of a central granular mass, the periphery of lymphoid cells, in a stroma of delicate, reticulated fibrous tissue. The organ exhibits the lesion of acute tuberculosis.

"The new formations situated in the peritoneum covering the bladder are composed of elements similar to those found in the nodules of the kidney, and have a like arrangement." *November 14th*, 1878.

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2. *Calculus of right and double ureter of left kidney.*

Presented by Dr. M. Longstreth.

Dr. Morris Longstreth read the history of this case, taken from the clinical records of the Pennsylvania Hospital, as follows:

A woman æt. 49, widow, admitted January 7, 1879, injured her back by falling down-stairs on the morning of admission. She had suffered four years with symptoms of calculous disease of the kidney and severe cystitis, and had passed several times small calculous masses from the bladder. Two years previously, after much suffering referred to the lumbar region, a sinus opened on the right side, near the crest of the ilium, posteriorly. The discharge from the abscess was abundant at the time of admission.

On admission, the pain and tenderness due to the injury were referred to the vertebræ of the upper dorsal region, but no displacement

of the spinous processes was detected, and no crepitus could be produced or felt. There was complete inability to move the lower extremities, or to raise the trunk, or to remain in the sitting posture after being raised up. There was nearly complete loss of sensation over the lower half of trunk, and lower extremities. There was retention of urine, requiring the catheter to be used to empty the bladder. The abdomen was distended.

On the third day, she could pass urine voluntarily; had some slight control of the legs; complained of severe pain between the shoulders. After this time the lumbar abscess discharged more freely, and became a probable source of great exhaustion. On the tenth day, a bed-sore commenced forming over the sacrum, and rapidly extended in breadth and depth. Several cicatrices of old leg-ulcers broke down and discharged freely. After a fortnight, the patient's strength rapidly declined, and she died on January 27th, 1879, the twentieth day after the injury. The patient was a large, strongly-built woman, and very fat.

Record of the *autopsy*, made by Dr. Longstreth, pathologist to the hospital.—The conditions of the heart and the lungs showed that the patient died mainly from the failure of respiration, and partly from exhaustion also; otherwise these organs presented nothing especial to note. The left kidney was increased in length, but not in breadth or thickness. After careful dissection, it was found that two pelves existed, each connected with a separate ureter. On separating the ureters from the collection of fat which surrounded them, they were found to unite at the brim of the pelvis, and to enter the bladder in the normal manner. On section of the kidney along its greater curvature, the two pelves were found quite distinct and separate; there was no demarcation between the two portions of the organ; no fibrous band separated them, and the same capsule passed equally over both. The portion of the organ connected with the lower pelvis—the smaller one—was uneven and lobulated, and its pelvis was very large relatively to its size. The renal tissue, the pelves, and ureters presented no morbid changes. Unfortunately, the vessels were divided before any malformation was discovered. Afterwards, in tracing its vascular supply, a large vessel, apparently a branch of the renal artery, was found entering at the hilum of the lower part of the organ in the usual manner. A small supernumerary vessel was connected with this portion of the organ, and entered its substance at the posterior surface. This branch it was thought was derived from the lumbar arteries. The vascular supply of the upper division of the organ appeared to be without irregularity. There was no peculiarity in the arrangement of the venous trunks.

The *right kidney* was surrounded by an immense quantity of fatty tissue. This organ was removed in connection with the aorta, the ureter, and the urinary bladder. The ureter likewise was surrounded by a collection of fat, measuring over an inch in diameter. On dissecting the fat from around the kidney, marked evidence of inflammation was found, and the same condition was noticed around the ureter. On section of the kidney-substance, the organ was found almost completely destroyed; its pelvis was greatly dilated, and contained a large, irregular calculus, with a very rough surface; at the upper part of the organ was an abscess, containing very thick, purulent matter, and one or two small fragments of calculous material; at the lower part, the cavity of the pelvis reached nearly to the surface of the organ. The interior of the pelvis showed very marked alterations from inflammatory changes, and was covered with thick, creamy pus, shreds of tissue, and small calculous masses. The vascular supply to this kidney presented no malformation; the calibre of the renal artery was very much reduced in size, from fibrous thickening of its wall. A calcareous mass was found in the aortic wall, at the point where this vessel was given off. The walls of the *ureter* were greatly thickened, and its mucous surface very uneven. The *bladder* showed very marked alterations from cystitis; in parts the mucous membrane was ulcerated, and showed calcareous incrustations.

The lumbar abscess had burrowed down along the crest of the ilium, and towards the lumbar vertebræ, without, however, involving the bony tissues. The abscess did not appear to be in any way connected with the diseased kidney.

There was a fracture of the fourth dorsal vertebra involving its body. The spinal cord at this part, for the distance of an inch, had been destroyed, and its tissues were absorbed. The inner membranes of the cord were greatly thickened and much injected. *February 27th*, 1879.

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3. *Horseshoe kidney and anomalous ureter.*

Presented by Dr. John B. Roberts.

Anomalies in the form of the kidney occur quite constantly, and therefore deserve a certain amount of attention from us, though they do not represent pathological changes. Sometimes we have one kidney entirely absent, while the other shows no variation except, perhaps, an increase in size; again we may have the two organs united at the lower extremi-

ties by an isthmus of renal structure extending across the spinal column, constituting what has been called the horsehoe kidney. These may have one or two ureters. The cases of fused or confluent kidney may, as is readily seen, present many variations; in fact, instances of quadruple kidney with four separate ureters have been recorded. Specimens of fusion of these organs have been presented to the Society at various times, but I believe they have not been so numerous as to render this malformed organ devoid of interest. The statement that the occurrence of renal anomalies is not infrequent I find substantiated by a list in the Transactions of the Pathological Society of London for 1861–62 (vol. xiii.), which says there were at that time nineteen specimens in the museums of London, but it is not certain from the context that these were all examples of confluent kidney. A specimen similar to the present one will be found in the first volume of our Proceedings.

This specimen before you was taken from a subject found in my dissecting-room at the Philadelphia School of Anatomy, and therefore we know little of the man to whom it belonged. The man had evidently died from injuries, and may, therefore, be supposed to have been in good health, especially as there was no great emaciation present. My attention was called to the anomaly after the abdomen had been partly dissected; and as there occurred no good opportunity of my dissecting the kidney, ureters, and bladder very carefully, I shall furnish a rather incomplete anatomical account of the specimen. As is seen, the right kidney is large, being about six inches in length, is of ordinary form, and is attached at its lower end to a rudimentary kidney about three and a half inches long. The normal organ occupied apparently the natural position, while the other lay across the spinal column in a more or less transverse direction, with its upper extremity located upon the belly of the left psoas magnus muscle, but not extending to the left of that muscular mass. The left organ is very thin, and seems to have but little secreting structure, for a great portion of the mass is occupied by the pelves, as will be shown. The right supra-renal capsule was not seen by me, but there is a structure resembling the capsule above the small rudimentary kidney. There are many large arteries entering the hilum of the right organ, and a number of small ones going to the concave or upper surface of the left. In addition, a trunk the size of a small quill supplies the confluent organ at its lower surface where the two portions unite. Unfortunately, I am unable to say whence these vessels come. The vena cava and right renal vein are seen, with what seems to be the right spermatic vein emptying into the latter. This is also an unusual occurrence.

The calices and infundibula of the right kidney open into a pelvis which is situated rather upon the anterior surface of the organ. The ureter is cut off at its commencement. At the anterior surface of the rudimentary portion of this horseshoe kidney are seen two pelves, which occupy the greater part of the front of the organ, which, by the way, has the appearance of being formed of two lobes. These pelves go downwards from the lower convex edge, and join together about half an inch distant from the point where they leave the kidney. The tube at that point is about one inch in diameter.

In order to see what was the condition of the ureters at their entrance into the bladder, since the portion intervening is lost to us, I secured the latter organ, after the subject was left by the students, and present it to the Society with the other specimen. The right ureter is of the usual appearance, and enters the bladder by a slit-like orifice; above this orifice a blind pouch runs up from the mucous surface of the bladder alongside of the ureter for about one and a half inches, large enough to admit a lead-pencil most of the distance. On the left side there remains attached to the bladder the stump of a tube nearly one inch in diameter, which is evidently the cystic end of the larger ureter formed by the junction of the two pelves of the rudimentary left kidney. This opens into the bladder by a mere slit at its bottom, similar to the orifice upon the right side. Alongside of this there is a cul-de-sac leading from the cavity of the bladder upward, large enough to admit the little finger for nearly an inch. It is certainly strange that such a large ureter should come from the rudimentary organ, while the tube is but little larger than usual on the right side, where was situated the kidney which secreted nearly all the urine. *February 27th*, 1879.

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4. *Sacculated kidney.*

Presented by Dr. F. P. Henry.

I have chosen, for the specimen I am about to present, the term sacculated in preference to surgical or cystic, because the term surgical, while conveying a dim idea of the etiology of the affection, gives none whatever of the morbid process, and the term cystic is also applied to another affection. I would suggest, as better than any of them, the term *alveolar*, on account of the striking resemblance which the dilated pelvis and calices of the kidney bear to a lung-alveolus with its vesicles.

This affection of the kidney is, I believe, invariably caused by a ste-

nosis in some portion of the genito-urinary passages, but in the case under consideration the point of obstruction is not manifest. There is, it is true, in the region of the fundus of the bladder, an intramural tumor, which, on being cut into, was found to contain pus and caseous matter, but it is not so situated as to compress the ureter, either at its orifice or during its course through the wall. Before the kidney was cut open, a very slight pressure upon it caused pus to flow freely into the bladder. There are well-marked evidences of cystitis, and cystitis alone is capable of causing the condition presented by this kidney. Indeed, vesical catarrh is given, by writers upon the subject, a prominent place in the etiology of the disease. I have seen no attempt to explain the modus operandi of this cause, but it is probably as follows:

In uncomplicated cystitis the bladder is never distended; its capacity is diminished by the thickening of its walls and the state of contraction in which it is habitually maintained. This contraction, which is great, becomes extreme so soon as a few drachms of urine have collected, and, as a consequence of this disordered function, the ureter and pelvis of the kidney have to serve vicariously as receptacles for the urine. In health the bladder is passive except during micturition, and offers no resistance to the function of the ureter; in cystitis the function of the ureter is interfered with, and the urine reaches the bladder largely (in some cases, perhaps, entirely) by hydrostatic pressure.

The ureter is dilated to the size of one's forefinger, and the kidney is converted into a large sac subdivided into numerous smaller cavities. The walls of the sac are thicker in the situation of the medullary cones than elsewhere, and here traces of gland-structure are plainly perceptible. The walls of the sac contain, in portions, numerous cheesy foci, varying in size from a pin's head to a pea, and large sections appear to be infiltrated with caseous matter. The capsule is greatly thickened, and, for the most part, easily separable from the surface of the organ. The cavity of the sac is lined with what appears to be a pyogenic membrane. The sac contained three-fourths of a pint of pus, and measures at present, after several weeks' immersion in alcohol, six inches and a half in length and four and a half inches in width at the centre. The ureter is only five inches long.

The patient from whom the specimen was taken was a male, æt. 28, who was admitted to the Episcopal Hospital on January 6th, 1879, for phthisis and cystitis. He was at one time transferred to the surgical ward, and sounded for stone by Dr. Forbes; no calculus being detected, he was returned to the medical ward. When I went on duty, on April

1st, he was greatly emaciated, and was annoyed by a constant dribbling of urine and pus, the lung symptoms occupying a very subordinate position. He died a short time after I went on duty, and without uræmic symptoms. The lungs were stuffed with tubercles.

The history of these cases is not always such as is here described. That a spontaneous cure of such a morbid process may occur is shown by a specimen I presented to the Society in 1876 (Path. Soc. Trans., vol. vi., p. 87). The kidney was a mere sac "encapsuling a quantity of mortar-like substance," which proved, on microscopic examination, to be inspissated pus. At one time the kidney referred to must have been in a condition very similar to the one now before the Society. In the specimen of 1876 the ureter was occluded, and it is possible that the first step in the direction of a spontaneous cure is occlusion of the ureter.

May 8th, 1879.

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5. *Cirrhosis of kidney.*

Presented by Dr. F. P. Henry.

The specimen of contracted kidney that I now present, a section of which I have placed under the microscope, is of interest, from the fact that it was taken from a case of phthisis, and, further, because in the recent state the granulations of the cut surface were so fine and translucent that I mistook the specimen for one of tuberculosis. It was not until I had made a microscopic examination of the gland that I recognized the true nature of the morbid process of which it is the seat.

The patient from whom the specimen was taken was admitted to the Episcopal Hospital on November 16th, 1878. From notes made by Dr. Starr at the time of admission, I find that the urine contained "a trace" of albumen. The case presented no unusual features of interest, and death occurred on April 7th, without uræmic symptoms. I have, on previous occasions, remarked upon the almost invariable absence of uræmic symptoms in cases of Bright's disease associated with phthisis. Those observations had reference to the amyloid and fatty kidneys, and to the large white kidney,—the kidney of chronic parenchymatous nephritis. The present case goes to show that the same law applies to the contracted kidney.

The section under the microscope shows an advanced stage of the morbid process. There is little or no cellular infiltration in any portion of this or of several other sections that I have examined, and in some

portions nothing but fibrillar connective tissue can be seen. The adventitia of the blood-vessels is thickened, and the renal tubules are greatly atrophied. Where of normal calibre, however, the epithelial lining is intact. There are no tubes to be seen devoid of epithelium,—a sure sign that the process was interstitial from the beginning, and not secondary to a parenchymatous inflammation. The glomeruli are of diminished size, and are surrounded by a ring of connective tissue.

May 8th, 1879.

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6. *Abscess of the kidney.*

Presented by Dr. E. T. Bruen.

A. J., colored, æt. 38, was admitted to my wards in the Philadelphia Hospital, March 3d, 1879. His account of his life during the months prior to his admission was very vague, but he had not been confined to bed. He had suffered from polyuria for several months; a week before the date of his application for admission to the hospital he had noticed a severe pain at the base of the left chest, accompanied with dyspnœa. The pain was particularly severe if he attempted to breathe deeply.

During the two weeks passed under my care the symptoms were as follows:

He was very deaf, though previous to his admission to the house he had full possession of the sense of hearing; his sight had become impaired, and on one or two occasions he appeared blind. There was a marked tremor of the limbs, so much so that when in the erect posture he was compelled to grasp objects near him to prevent his falling to the floor. His intellectual condition was very nearly approaching imbecility. The temperature ranged from 101° F. to 103° F., the skin very dry, and a physical examination revealed an effusion in the left pleural cavity. There were no sweats nor chills at any time.

Polyuria was very marked; he passed daily from one hundred and forty to two hundred and fifty ounces of urine. The urine was of very low specific gravity (1003); a trace of albumen by Heller's test; very scanty sediment, which, on examination, was found to contain a very few granular and hyaline casts.

At no time during the period of my observation of his case did the above description require modification.

It is to be observed that there was no hypertrophy of the heart, nor increased intensity of the aortic second sound. Death occurred March

19th, 1879, the only change in the symptoms being an increased hebetude, with loss of strength, and the blindness and deafness increased. No retinal changes could be noted with the ophthalmoscope.

At the *autopsy*, made twenty-four hours after death, the viscera, including the brain, were carefully examined, but were found to be free from pathological changes, with the exception that the thoracic cavity contained a pint and a half of purulent fluid, and the kidneys, which I present this evening. The left kidney weighed six ounces, was fatty and somewhat contracted; the right weighed thirteen ounces. On cutting into it, the cortical portion was found to be occupied by laudable pus; the pyramidal portion contained pus at various points, the entire organ resembling the cavity of an abscess; no evidence of an embolic origin existing. The walls of the bladder were normal in every respect.

The symptoms during life led me to believe that my patient suffered from a contracted granular kidney, with pleurisy, to which I ascribed the high temperature. The general symptoms of transient blindness, deafness, and mental torpor I ascribed to approaching uræmia, notwithstanding the absence of important symptoms of this condition, as vomiting, convulsions, etc., and the presence of the high temperature.

The etiology of abscesses of the kidney is so obscure that I have thought it desirable to record this case, although it is of a negative character. *May 8th*, 1879.

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7. *Cystic kidney.*

Presented by Dr. James Tyson.

The patient from whom the kidneys were removed was a gentleman, 43 years of age, whose business was farming and the purchase and sale of cattle, on account of which he made frequent fatiguing journeys to the West. He first consulted me in May, 1878, and related that his first illness was in 1864. It was evidently nephritic colic. Severe lumbar and abdominal pain continued to recur, more particularly after exposure to cold, until 1865, when he passed a small calculus. He was relieved for three years, having then another attack, during which he passed a sediment which he described as "steel-colored," and, finally, another small calculus, also "steel-colored." There was again an interval of relief until 1873, when there occurred a long series of attacks, in the last of which, in 1874, he passed quite a large stone, three-quarters of an inch long and one-third wide, which he described as having a white coating

(phosphatic?). From this time there had been more or less dull pain up to the date of his visit. His urine, which for some time previous had been dark-hued, had lately assumed a lighter hue, and, while brick-dust sediment formerly was observed, it had lately disappeared. Pus was first observed in his urine in 1875, by Professor Reamy, of Cincinnati. He had had no acute attack during the year 1878, up to the date of his visit to me. He had been sounded for stone in the bladder four times—twice in 1864, once in 1865, and once in 1875—without any results.

At the time of his visit to me he was getting up to pass water from four to eight times in a night, and during the day could not retain it longer than one and a half hours. His urine was pale-amber in hue, had a specific gravity of 1012, and deposited a considerable amount of pus ($\frac{1}{16}$ bulk). There was also a small amount of albumen, not more than a line by Heller's acid-test. The bladder symptoms were very much relieved by sandal-wood oil, but he continued to have attacks of lumbar pain, always after exposure to reduced temperature, especially if he happened to be over-heated at the time.

On the evening of January 15th, one week after his return from a trip to the West during an extremely cold season, he was seized with one of his attacks, the pain being chiefly on the left side. The attack was one of unusual severity, but he was relieved by a hypodermic injection of half a grain of sulphate of morphia administered by his physician, Dr. W. H. Barr, of Middletown, Del. The relief was complete, but he remarked to Dr. Barr, on the morning of the 17th (about thirty-six hours after the attack), that he had not passed water since two o'clock of the 15th, and had no desire to pass any. I saw him on the 18th, reaching Middletown at two o'clock, just seventy-two hours after he had passed water. The bladder was empty, as shown by the use of the catheter. He was entirely free from pain, but was suffering a good deal from nausea, which had made its appearance the day previous. He was slightly drowsy, but he was so far conscious that he could pass the catheter on himself, as was his custom occasionally. The drowsiness, however, increased during the four hours I spent with him. He was cupped over the loins, and the cupping followed by hot cataplasms, and, in the course of the next nine hours, was freely purged by elaterium and sweated by jaborandi. The treatment availed nothing, however, in relieving the suppression. The drowsiness increased, and he died at noon of the 20th, one hundred and eighteen hours (within two hours of exactly *five* days) after he last passed water.

The *autopsy* was made by Dr. Barr, fifty-six hours after death. The

bladder appeared not to have been examined, but all the other organs in the abdomen except the kidneys were normal. The latter are presented to the Society, but the left one has lost almost entirely the appearance which made them, in conjunction, among the most striking specimens of morbid anatomy I have ever seen. It will be observed that one (the right) is sacculated, the cysts ranging from half an inch to one and a half inches in diameter, and being round and oval; in one of them is imbedded a calculus as large as a pea. The others were filled with a yellowish and odorless fluid containing albumen. They were not lined with an epithelium. It is also larger than the normal organ, weighing six and a half ounces. The capsule was strongly adherent. *Microscopic examinations* of thin sections exhibit the appearances of interstitial nephritis, and the condition is evidently one of long standing, the result of the constant hyperæmia caused by the calculi which have from time to time formed, and all of which seem to have escaped except the one still shown in position. In the parenchyma numerous infarctions of blood are seen, and the epithelium is fatty in places. The left kidney exhibited a great and most interesting contrast to the right. It was throughout of a beautiful bright-scarlet color. It weighed seven ounces. The capsule was only slightly adherent; surface smooth. On section, it presented a homogeneous, very bright red color. It was hard in consistence. There were no cysts. The pelvis was somewhat dilated. Microscopic examination showed large, swollen tufts, the epithelium of the tubules largely swollen and desquamated, the blood-vessels normal but over-distended by blood, with other features of a parenchymatous nephritis.

Dr. Tyson said there were one or two points to which he would like to refer. First, the question had been raised, How shall a cystic kidney be recognized? This was a question he had frequently asked himself, and he thought all cases might be divided into two classes, one comparatively easy and the other difficult of recognition. The former include cases accompanied by disease of the bladder; wherever there has been long-continued cystitis, especially in men, we may expect to find a cystic kidney. In the second series of cases, where there is no pus in the urine and no bladder symptoms, we cannot foretell the condition of the kidneys.

He was interested also in the remarks made by Dr. Formad with regard to casts and albumen in interstitial nephritis. In none of the cases presented were casts found, although pus and albumen were present. This is constantly the case in cystic kidney. The absence of albumen with the presence of casts is a very rare occurrence, but it sometimes is seen,

and, to avoid error, Dr. Tyson thought it better to make the microscopical examination before the chemical test for albumen.

Dr. Starr said that he recalled two cases in which casts were present in non-albuminous urine.

The first, a boy 3½ years old, had scarlet fever early in March, 1875, and died of meningitis five months later. During the interval, he had had two attacks of acute desquamative nephritis. The first occurred, in spite of every precaution in regard to diet and exposure, on March 29th, three weeks after the onset of the fever, and subsided about the end of April. The other began on June 1st, the urine being scanty, having a smoky appearance, a specific gravity of 1030, an acid reaction, and containing a large quantity of albumen, numerous epithelial- and blood-casts, and many free blood-corpuscles. On the 14th the urine became more copious and commenced to clear up, and by the 29th it was passed in abundance, was perfectly clear, and contained no albumen, but a few granular and hyaline casts. Subsequently, on July 25th and August 7th, 8th, and 10th, the urine, which was normal in quantity, color, reaction, and specific gravity, was carefully examined and found to be absolutely free from albumen, though the microscope revealed many hyaline and slightly-granular casts.

The second case, a boy 5 years of age, had scarlatina in February, 1879. The attack was so light that the child was not considered ill enough to be put to bed or to require a physician. When I first saw him, on March 6th, his hands and feet were still desquamating, and there was considerable anasarca. The urine was diminished in quantity, acid, dark-colored, deposited a soot-like material on standing, and contained a quantity of albumen and numerous epithelial, granular, and hyaline casts. He improved rapidly under treatment. On March 26th, the dropsy had disappeared; the urine contained a few hyaline casts, but no albumen. On April 1st, there was a slight return of the renal congestion, indicated by the reappearance of the soot-like deposit and a small amount of albumen. Four days later the urine was again clear and free from albumen, but contained a few hyaline casts. From this time up to April 26th, when the child passed from observation, apparently perfectly well, the urine was examined several times, and found to contain hyaline casts, although non-albuminous.

In the first case the microscopic examinations were made by Dr. Tyson; in the second by Dr. Simes. *May 8th*, 1879.

8. *Horseshoe kidney.*

Presented by Dr. H. F. Formad.

These anomalous kidneys are from a man, aged about 45 years, who died in the surgical ward of the University Hospital (service of Prof. John Ashhurst, Jr.). The diagnosis was cystitis and phthisis; the history I could not obtain. I recollect to have repeatedly examined the urine of this man in the pathological laboratory; it showed always the usual evidences of a chronic cystitis,—epithelial cells from different layers of the bladder, in connection with pus and a thick mucus,—but at no time were seen any tube-casts; albumen was found in small quantity.

The *autopsy*, which I made at the request of Dr. Palmer (the resident physician), confirmed the diagnosis, the wall of the bladder being greatly thickened, and showing numerous erosions of the mucous membrane covered with a thick mucus. There were also foci of cheesy degeneration in the lungs, some of them softened and producing cavities.

The greatest interest, however, is presented by this rare and unexpected condition of the kidneys. The two kidneys were fused at the lower end through a band, forming a so-called horseshoe kidney. The right kidney occupied apparently the normal position in the body (perhaps a little higher than usual, as its upper end had moulded itself into the right lobe of the liver, producing in this organ a distinct depression); the left kidney had a nearly transverse position, a part of it and the uniting band lying across the spine. The weight of these combined glands is thirteen ounces, the right kidney being the largest (about three-quarters of the whole bulk), whilst the remaining quarter of the glandular mass represents the smaller (left) kidney and the uniting band. Each kidney has its own well-formed blood-vessels and a separate ureter. In addition, both kidneys are diseased, and it is remarkable that each of these glands is affected differently. The left one is made up of a number of cysts filled with a thick, grayish-white mass resembling putty, the whole secreting structure being destroyed. The capsule is adherent; length of the gland, five inches; breadth, two inches; shape, elongated; surface, smooth. The pelvis is dilated; its ureter obliterated. Examined microscopically, the inner surfaces of the cysts are not lined by epithelium, and the mass filling them is composed of pus, cholesterin, and débris of the glandular structure, with traces of former hemorrhages. The secreting structure is here probably atrophied and destroyed, through the pressure of continuous hemorrhagic infarctions. We have here a condition of the gland called sometimes surgical kidney, perhaps

better denominated *scrofulous kidney*. The right kidney, on the other hand, is quite large, and pear-shaped; length, nine inches; capsule not adherent. When fresh, it was, on section, deep red. The gland is evidently hypertrophied from the continuous congestion called forth by its double work. Microscopically, it shows a typical *parenchymatous nephritis*. The uriniferous tubules are crowded with swollen, cloudy, epithelial cells, the glomeruli swollen, the blood-vessels highly congested, etc. No tube-casts were, however, seen in the tubuli.

The band by which the two kidneys were fused was surrounded by a great deal of adipose tissue; it is about two and a half inches long and one and a half inches thick, and, under the microscope, is seen to be made up of true kidney-structure, with an excess of connective tissue.

May 8th, 1879.

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9. *Cystic and tubercular kidneys.*

Presented by Dr. H. F. Formad.

These kidneys are from a girl aged 19, German; occupation, milliner; family history good. A year ago she contracted a cold, had high fever and cough, and, although she soon left her bed, was never well since, and began to lose flesh. Her menstruation became irregular and scanty, and finally ceased altogether. She never had hæmoptysis. I saw her for the first time six months ago, diagnosed phthisis, and treated her accordingly. She had also cystitis,—ascertained by the symptoms which accompany this affection, and by microscopic examination of the urine. The latter was carefully examined nearly every week up to the time of the patient's death, but at no time could any indication of kidney-disease be demonstrated. Albumen was found at times in very small amount; quantity of urine was usually about normal; suppression never occurred.

The *autopsy* confirmed the diagnosis. Besides, it revealed tuberculosis of the spleen and a fatty liver; but, in addition, there was found intense kidney-disease, which it was impossible to diagnose during life.

The *right kidney* is reduced to a quarter of the normal size; weight one ounce; capsule adherent; ureter and pelvis completely obliterated. On section, the glandular structure is seen to be perfectly destroyed and replaced by cysts,—one the size of a walnut, and several smaller ones. The cysts are smooth internally, and filled with an odorless, reddish fluid containing albumen.

The *left kidney* is enlarged to nearly double the normal size; weight

ten ounces; capsule not adherent. On section, the parenchyma is of a dark-red color; numerous grayish nodules were seen; also a few small softening cysts.

Microscopic Examination.—The walls of the cysts of the right kidney were found to be lined by long columnar epithelium; the fluid of the cysts contained large and small epithelium,—both columnar and squamous,—together with fragments of broken-down uriniferous tubules and Malpighian glomerules, leucocytes, and cholesterin. The left kidney showed a typical parenchymatous nephritis, the whole parenchyma, moreover, being infiltrated by embryonic cells, obscuring, in circumscribed spots, the glandular structure. In these spots the cells are collected in dense groups, and are imbedded in a reticulum free of blood-vessels, thus resembling miliary tubercles. No tube-casts could be observed in the uriniferous tubules; their absence here, as well as in the urine, is an interesting feature in this case.

The view of Professor Tyson, that there is a frequent coexistence of cystitis and cystic kidneys, has in this case an additional support.

I do not believe that tube-casts ever are retained any length of time in the tubules of the kidneys. Charcot and some other writers on kidney-diseases assert that casts formed in the convoluted uriniferous tubules are prevented from passing out with the urine through the constriction of the loops of Henle. I have several times observed, in sections, that these constricted portions of the tubules are capable of considerable distention or widening when filled with casts, new-formed cells, or any urinary concretions. The tubules are made up of an elastic substance, which can easily be distended wide enough, certainly, to allow the passage of such soft and compressible bodies as the urinary casts, especially under the high pressure which is exerted upon them by the column of urine. I am also led to believe that there is not a loop of Henle connected with every glomerule or every convoluted tubule. Henle himself does not assert the invariable accompaniment of a loop to each glomerule, although this is erroneously taken to be the case; it has, however, never been proven. Examining some sections made across the whole of a cat's kidney by the cutting-machine, after the method of Dr. Seiler, it appeared to me that a uriniferous tubule started from the glomerules and passed down to the papilla, without diminishing in its course in calibre, and without forming a loop of Henle. If this is frequently the case (and probably it is), then my argument that urinary casts formed in the convoluted tubules can always easily pass out with the urine has an additional support. The investigation of my friend George H. Rose, to whom I

suggested to work up this subject, points also decidedly to the affirmative of the above suggestion. *May 22d*, 1879.

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10. *Cystic kidneys.*

Presented by Dr. R. W. Deaver, for Dr. W. W. Lovejoy.

G. F. B., æt. 42, artist; irregular habits; had been ill for six months, though he had worked at his easel two weeks before his death. In the early part of his illness had severe dyspeptic symptoms.

Had been under homœopathic care until forty-eight hours previous to his death, when I first saw him. He was propped in a chair, face injected, breathing rapidly, and in a state of partial stupor. His feet were swollen and dropsical, the œdema reaching above the knees; skin was hot and pulse rapid; had a slight cough, and had complained of pain in left side. The next day he was flighty and restless; pulse and breathing jerky. His delirium was of a happy character, though, other than one-twelfth grain of morphia, no drug had been taken. He died the following night.

As far as could be learned, he had never had any retention or suppression of urine, and a specimen passed two hours before death was free from albumen. His homœopathic adviser had found it necessary to tap both his abdomen and legs several times, and, the day before I saw him, had given him one-quarter grain of morphia.

Owing to his hopeless condition when first seen, no physical examination of his chest was made.

Post-mortem.—On opening the thorax, the lower portion of the right lung was consolidated and its surface covered with recent lymph; the right pleural cavity contained one and a half pints of effused liquid. The left lung normal; heart dilated, but no valvular disease; the liver normal in size, with very little irregularity upon its surface,—possibly a cirrhotic change, though it was very slight. The abdominal cavity was filled with liquid; the kidneys were enlarged, studded with cysts,—their combined weight three and a half pounds. *June 26th*, 1879.

b. FEMALE ORGANS OF GENERATION.

11. *Double uterus.*

Presented by Dr. A. S. Reynolds.

S. F., æt. 24 years, died November 13th, 1878, from typho-malarial fever. The history of the case, as far as relates to the malformation, is as follows. She began to menstruate at 15 years of age; was always regular in time, but excessive in quantity. She was married at 19, had first child at 21 and second at 24 years of age, twelve weeks before death. Each confinement was followed by profuse post-partum hemorrhage.

The position of the uterus and appendices was seemingly normal, and they were only removed to examine what was at first thought to be some abnormal growth in the course of the right Fallopian tube.

On examination, the specimen is found to be a malformed uterus, double in all its parts above the external os.

The uterus in the line of the genital canal measures two and a half inches in length, is unicornuous, and has a single Fallopian tube attached to its fundus, directly in a line with the cervical canal. The cervix is about one inch in length, and normal in thickness, except in its relation with the cervix of the second uterus to form a common external os, where it is somewhat thinner. While the external appearances indicate a uterus about normal in size and weight, it is seen in section that the walls are thicker and the cavity smaller than normal. As this uterus is the one in which the last conception occurred, it is probable that involution is not yet complete. In the ovary of this side can be seen several Graafian follicles and the corpus luteum of her last pregnancy.

Beginning at the very margin of the external os, on the right side, and running at right angles to the median line, is a canal, but little less in diameter than the normal cervix, three-quarters of an inch in length, expanding into the triangular cavity of the body of the second uterus, which measures one and a half inches in length, two inches in circumference, and one inch in diameter. The walls are about one-quarter of an inch thick. From the fundus is given off the single Fallopian tube, which, being normal, requires no description. The surface of the ovary of this side exhibits the cicatrices of several follicular eruptions.

As special pathological interest in the anomaly is unsupported by accurate clinical data, we will simply advance the following hypotheses:

1st. That the double uterus in some way explains the constant menorrhagia.

2d. That the complicated arrangement of the cervices may have been the cause of the excessive post-partum hemorrhage.

3d. That, as both organs seemed functionally active, double conception was possible, thus affording a unique and probably fatal complication of labor.

Report of the Committee on Morbid Growths:

"The histological elements of the portion of tissue submitted to your committee for examination are found to be spindle-shaped cells, containing the characteristic rod-shaped nucleus of smooth muscle-cells, arranged in laminæ as seen in a section of the uterus; numerous blood-vessels cut in every direction were found." *November* 14*th*, 1878.

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c. MALE ORGANS OF GENERATION.

12. *Pathology of urethral stricture.*

Presented by Dr. John H. Brinton.

Dr. John H. Brinton exhibited to the Society a series of specimens illustrative of stricture of the urethra. These specimens, Dr. Brinton stated, had been taken from patients who had died at various times during the last eight years at the Philadelphia Hospital, and were in the highest degree instructive, showing, as they did, how fatal consequences under certain circumstances may follow operations usually regarded as comparatively free from danger. In presenting the preparations for the study of the members, Dr. Brinton remarked that it must be borne in mind that the operations in the several cases were performed upon patients in the lowest social scale. These were, in fact, paupers, confessing to intemperate habits, and whose lives, as far as known, were of the most irregular and exposed character. In every case operative interference of some sort was unavoidable, of necessity and not of mere election, and the special operation performed was chosen with the view of giving each patient his best chance of recovery and life. These facts must be recollected, so that neither operator nor operation may be unfairly credited with results which should properly be charged to the patient's disease, his broken constitution and depraved circumstances of life.

The first of these specimens is a urethra and bladder, with the following history.

W. G., æt. 37, of intemperate habits, was admitted into the Philadelphia Hospital in 1870, suffering from a stricture the result of a gonorrhœa contracted four years previously. The stricture was annular in character, one-quarter of an inch long, and distant from the meatus two and three-quarter inches. He had for two years experienced great difficulty in micturition, and frequently introduced a flexible catheter himself. After drinking, the stricture was usually very tight. When first seen, he could not urinate, and the introduction of the catheter produced much irritation. The stricture was first divided carefully by Charrière's urethrotome from behind forward, and then slightly dilated by a Holt's dilator, and Thompson's sound No. 16 of the French scale carried into the bladder. The urine was subsequently drawn off by a No. 8 English flexible catheter. Three days after the operation, suppression of urine occurred, followed by death two days later,—that is, five days after the operation.

Post-mortem examination exhibited both kidneys large and congested, ureters normal, bladder holding six ounces of high-colored urine, vesical mucous membrane slightly congested but not softened. A urethral stricture, two and three-quarter inches from meatus, was well divided. There was no extravasation or urinary infiltration below the mucous membrane. An old false passage extended from one inch in front to two inches behind stricture, admitting a No. 10 English sound. There was great congestion of prostatic sinus, and beneath this, on the left side, a cavity half the size of an almond, filled with pus. The prostatic plexus of veins was dilated, inflamed, and gorged with blood. It will be noticed that here the brunt of the destructive action had fallen upon the prostate gland and plexus of veins, and upon the kidneys.

Preparation No. 2 was taken from a negro, W. D., æt. 35, who was admitted into the hospital June 13th, 1872. He had at that time two strictures, both firm and annular, and situated respectively one inch and two and a half inches from the meatus. A whalebone filiform could with difficulty be carried through the strictures. Urination was attended with much straining and difficulty. Some irritation followed the introduction of the filiform bougies. On June 26th, internal urethrotomy was performed with Charrière's urethrotome, and Thompson's sound No. 18 was carried into the bladder. In three or four days the patient could introduce No. 18 or 20 flexible catheter himself. He passed his water readily, and was apparently in good condition. On the 20th of July he

lay down in the wet grass to sleep; nephritis ensued, and he died July 26th, thirty days after the operation. The *autopsy* revealed multiple abscesses in both kidneys, with dilatation of ureters and pelves. The bladder was thickened and contracted, with a capacity of scarcely two ounces. The incisions through the strictures were completely healed, and the calibre of the urethra was well established.

In the third preparation upon the table we have a stricture the result of a gonorrhœa contracted seventeen years before, developed in an intemperate man, J. W., 45 years of age. He was admitted into the Philadelphia Hospital on the 13th of December, 1873. He stated that the symptoms of the stricture first appeared after a march, while in the army, in 1864, and that since that time he had been troubled every six months or so with retention of urine, usually brought on by drinking. He had retention when admitted, which was relieved by catheterization with flexible instruments of small calibre. Metallic instruments up to No. 15 or 16 French were subsequently introduced, but he gradually became weaker and more emaciated, and died on January 20th, 1874. During the treatment he voided pus from his bladder in large quantities, and he occasionally suffered from retention. He was subjected to no operative interference, except the gentle catheterism above referred to. At the *post-mortem* examination the walls of the bladder were found to be thickened and suppurating, and its cavity contained two and a half or three ounces of pus. In front of and surrounding the anterior portion of the prostate was an abscess the size of a walnut. On opening the urethra, a stricture an inch long was found, one and a half inches in front of the membranous urethra, and beneath the stricture a false passage running backward in the direction of the triangular ligament. This false passage communicated with the urethra by three small openings before it connected with the membranous urethra through its main opening. At the time of his death the patient was greatly emaciated, weighing little over one hundred pounds.

The fourth specimen exhibited by Dr. Brinton consisted of a bladder, urethra, testicles, and kidneys, taken from a German, L. S., æt. 41, admitted to the Philadelphia Hospital, February, 1875. When received into the hospital the man was in a very terrible condition, and stated that he had decreased in weight more than fifty pounds during the last month. He was suffering from a urinary abscess of large size, the perineum, scrotum, and adjoining structures being greatly distended. The abscess, which burrowed in every direction, had ruptured by the side of the anus, and through this adventitious opening all of his urine passed,

none coming by the meatus. The man was weak and feeble, with a quick pulse. The insertion of a sound revealed a firm stricture a little more than two inches from the meatus. With some difficulty a filiform whalebone was carried through the stricture, and over it a small catheter, through which a small quantity of urine was drawn off. The patient's condition was so urgent that it was determined to make an immediate attempt to open up the urethra and to check the burrowing and extension of the abscess. A free incision was accordingly made in the abscess, and a large quantity of urine and pus evacuated. The finger, carried through the wound, passed into a large abscess surrounding the prostate and extending up on the right side of the bladder. The apex of the abscess could not be reached by the aid of the finger. A filiform whalebone was passed through the stricture, which was readily burst by Voillemier's dilator; Thompson's sound No. 25 was then readily introduced into the bladder. A large-sized flexible catheter was inserted into the bladder, and left *in situ*. The patient gradually became weaker and weaker, symptoms of uræmic poisoning appeared, and he died five days after the operation.

The following were the *post-mortem* appearances: kidneys enlarged and congested, ureters healthy, bladder contracted and walls thickened; tubercular deposits in both lungs, and also similar deposits studded over the surface of the bladder. A large urinary abscess reached nearly to the top of the bladder, involving the front of the prostate gland, and communicating by two openings with the membranous urethra. There was a large tubercular abscess in the right testicle. The effect of the divulsing instrument had been to fairly slit up the stricture and the mucous membrane for an inch and a quarter as sharply and cleanly as if they had been cut by a knife. There was no infiltration external to the mucous membrane.

5th specimen.—In January, 1877, D. S., æt. 45, was admitted into hospital suffering from two strictures, the result of two attacks of gonorrhœa, which had been contracted, one ten years and one one year previously. He had great difficulty in urination, and at times suffered from complete retention. At first only the smallest catheter could be passed; but the size was gradually increased, so that in twelve or fifteen days an English No. 8 could be introduced. The strictures, which were situated, one two and a half inches and one five and a half inches from the meatus, were then gently stretched by Holt's dilator, but not divulsed. This proceeding was followed by a high degree of urethral fever, and by persistent hiccough, and the patient died eleven days after the operation.

The urine was carefully examined before the operation, but not a trace of albumen could be detected.

At a *post-mortem* examination, the kidneys were found to be greatly enlarged, each one displacing more than one hundred and fifty ounces of water. Each kidney was filled with multilocular cysts containing a limpid fluid. Both lungs were œdematous, but not pneumonic. Heart normal. Liver normal, but pressed up against the diaphragm. The urethra appeared healthy; the stricturing points could be readily made out, but admitted No. 10 instruments. The mucous membrane was not torn, split, or congested.

The last specimen exhibited by Dr. Brinton presented the following history. C. I., a man aged 66, of intemperate habits, was admitted into the Philadelphia Hospital in the early part of 1878. He had had a gonorrhœa when young, and twenty years since, having difficulty in passing his water, he went to a dispensary, where the meatus was cut by a bistoury, and bougies passed. The meatus afterwards recontracted, and from time to time he has himself passed small flexible bougies and catheters. At times the opening of the meatus was, he said, very small indeed, and gave him much trouble in urination, and some pain when he attempted to dilate it. On the 9th of February, about two o'clock in the afternoon, Dr. Brinton, at the patient's earnest request, divided, with a Charrière's urethrotome, the stricture, which was very firm and dense, and situated about three-eighths of an inch from the meatus. The patient experienced no pain during the momentary operation. A little quinine and opium were ordered him, and he was directed to remain in his bed until the morrow. At 7 P.M. he passed his water, and was quite comfortable. At 11 P.M. he had a chill, which lasted fifteen or twenty minutes, but was relieved by hot coffee and external warmth. Five grains of quinine were then given him; he slept comfortably from twelve until three, and from three till six in the morning; at this time he awoke, talked with the nurse without experiencing any chill, discomfort, or unusual feeling, and five minutes afterwards turned over in his bed and died.

The *post-mortem* examination was made under the direction of Dr. Shakespeare, the pathologist of the hospital, but the most careful scrutiny failed to detect in any organ the cause of death.

After the specimens above described had been examined by the Society, Dr. Brinton briefly directed the attention of the members to the manifold causes of death in the respective cases,—to wit, inflammation of the prostatic plexus of veins, inflammation of the prostate gland, and

prostatic abscess, acute nephritis, pyelitis, multiple abscess of the kidney, cystic degeneration of the kidney, extra-prostatic abscess, and tubercular deposits in the bladder and testicle. He remarked that while in most cases the autopsy sufficiently accounted for the fatal result, in the case last recorded absolutely nothing was developed which threw any light on the cause of the death. The man was operated upon, and in eighteen hours died; whether in consequence of the operation or simply as a coincidence, it is impossible to say. And here it is worthy of observation that the little incision at the meatus is one which has always been looked upon as trivial to the last degree, and one with which the idea of danger is never associated. In fact, so little is it dreaded that division of the meatus is daily required as a preliminary step to urethral exploration.

The period after operative interference at which death occurred is also a matter of interest: it varied in the cases reported from eighteen hours to thirty-seven days. In all of these cases urethral fever had been present to a greater or less degree. The presence of this condition after surgical interference with the urethra is, as is well known, most common, and in fifty-eight cases of urethral operation, viz., division, internal urethrotomy, and external perineal section, Dr. Brinton stated that he had met thirty instances of urethral fever, eleven of which were very severe.

As far as his experience went, it would seem that urethral fever attended with astonishing impartiality upon every form of urethral operation, the severity of the attack being by no means in proportion to the gravity of the operation. As to the localities of stricture, his observations agreed in the main with those of Sir Henry Thompson. Thus, of 132 strictures present in 100 cases, the distribution was as follows:

At meatus	5	At 4 inches from meatus	12
At ½ inch from meatus	7	" 4½ " " "	6
" 1 " " "	4	" 5 " " "	16
" 1½ inches " "	4	" 5½ " " "	24
" 2 " " "	4	" 6 " " "	23
" 2½ " " "	6	" 6½ " " "	5
" 3 " " "	9	" 7 " " "	3
" 3½ " " "	4		

In 68 patients the strictures were single; in 29, double; in 3, triple.

The cause of the stricture in the vast majority of instances noted was a gonorrhœa, contracted at various prior periods, varying from one to thirty years, and often terminating in a persistent gleet.

Dr. S. W. Gross said the specimens which have been presented by Dr. Brinton were of extreme interest, as they illustrate the fact that when we have a stricture of the urethra with other diseases of the urinary organs, we are very liable to have unfortunate results follow any operation to relieve the stricture. In hospital practice such as we have it in the Philadelphia Hospital, where the patients come as a last resort, Dr. Gross found all operations upon the urethra to be very fatal, as the specimens exhibited very evidently show: the cause of death in these cases is seen to be various,—surgical kidneys, pyæmia, disease of the prostatic veins, etc. In private practice the results are very different. All of the operations of Dr. Brinton seem to have been of a gentle kind; the dilatation has not been excessive, and there has not been much shock. In the cases operated upon by him (Dr. Gross) he had taken the calibre of the urethra and endeavored to restore it to its normal size. Of twenty-five cases operated upon in the Philadelphia Hospital he had four deaths; in private practice, of seventy-six cases operated upon, no deaths. He had been very careful to bring his patients under the influence of quinine, after the operation to administer hypodermically morphia, and avoided exposing the patient to cold. Dr. Gross had frequently found before the operation that an examination of the urine gave no indication of disease, but immediately after the operation albumen was present. He did not consider the operation dangerous. Death had occurred in two cases in his wards from relieving the bladder of urine by a catheter. Hospital cases are exceptions: no matter what we do, they die; and we should not draw conclusions from them. His experience with the location and number of strictures in the urethra differed somewhat from that given by Sir Henry Thompson: thus, in 200 cases, representing 353 strictures, the seat of the constriction is represented by the following table, the figures denoting inches and parts of inches, commencing at the termination of the urethra at the meatus:

¼	25	4¼ to 5¼	45
¼ to 1¼	55	5¼ to 6¼	118
1¼ to 2¼	25	6¼ to 7¼	46
2¼ to 3¼	24	7½	1
3¼ to 4¼	14		

Of the 200 cases, in 101 the stricture was single; in 61, double; in 30, triple; in 5, quadruple; in 2, quintuple; and in 1 there existed eleven strictures.

The exciting causes of the lesion in the 200 cases were gonorrhœa in

160, masturbation in 26, lithiasis in 4, traumatism in 4, phimosis in 2; while it could not be determined in 4.

He thought the operations were not dangerous, provided the rest of the urinary tract was healthy; divulsion not more so than internal urethrotomy: in the latter we can define the stricture and cut it only; with divulsion we do not know what we are doing.

Dr. Brinton said, in answer to the question of a member as to his method of operating, that he usually prefaced his operations by the administration of quinine, and, if the patient seemed feeble or nervous, by a little stimulus. During the operation, which was performed under ether, every precaution was taken to guard against cold, by wrapping the limbs in blankets, and by covering the chest; afterwards quinine and opium were given internally, or morphia was used hypodermically. The amount of dilatation he employed was moderate, not usually higher than a 22, 23, or 24 Thompson's sound. Frequent instrumentation was most carefully avoided, and any introduction of a catheter or sound was deferred, if possible, until three or four days after the operation, and even then was practised with the utmost caution and gentleness. When the parts were very tender, the patient was permitted to give himself a whiff of ether, so that an instrument could be inserted during the occurrence of that period of early momentary anæsthesia which has been pointed out by Dr. Packard. Dr. Brinton had never lost a case of operation for stricture in private practice.

Dr. Gross said, with hospital patients we may very frequently have urethral fever and suppression of urine. In private practice this is not the case; he very seldom had in the latter case a chill to follow the operation. Out of 76 cases 9 were so complicated, 2 being the operation of divulsion, and 7 internal urethrotomy; 4 of the last had the operation performed under an anæsthetic. From gradual dilatation he thought there was little danger of fever. He did not believe in gradual dilatation, and thought that stricture could be cured by internal urethrotomy.

Dr. Hunter asked if any of the cases operated upon by internal urethrotomy had had any return of the stricture, and, if so, how long after the operation. He himself always depended upon gradual dilatation; but in all, if the bougie was not introduced at regular intervals, there was a return of the trouble. The cutting operation leaves a space, which is filled up by cicatricial tissue, which tissue is peculiar in that it contracts: it may be that when formed in the urethra it is of a different nature.

Dr. Gross, in reply, said it was very difficult to follow cases after operations. He had been able to trace five. In one, three years after

the operation there was no return of the lesion; in the others the time since the operation was not so long, being one year to eighteen months, but as yet there had been no return.

Dr. Shakespeare said that more than a year ago he had occasion to study under the microscope some thin sections from two pieces of stricture of the urethra. In the tissue constituting the stricture, besides the usual elements of newly-formed connective or cicatricial tissue, he had found yellow elastic fibres in great abundance. At this same period he had examined cicatrices of incised wounds of the skin, and had failed to demonstrate in them elastic elements.

He thought that possibly the presence of elastic fibres in great numbers in strictures of the urethra might be a very constant occurrence, and might suggest a reason why a cicatrix following division of a urethral stricture has not so strong a tendency to contract as has that succeeding a wound of the skin.

Dr. H. Lenox Hodge said that we must not be led away by the attractiveness of the results of operations for stricture from the pathology of the stricture itself. One of its most marked characteristics is the tendency of the stricture to contract. This shows itself at the beginning, and continues throughout its whole history. Another point of interest in the pathology of stricture is the influence of the curvatures and variations in the diameter of the urethra in determining the locality of the stricture. Again, in all cases of stricture where there is marked contraction of the canal, there is, of necessity, also some pathological condition of the bladder, ureters, and kidneys. The impediment to the flow of urine produces in time chronic cystitis, dilatation of the ureters, and congestions, inflammations, and suppurations in the kidneys. Therefore, in old and bad cases of stricture the constitution is impaired by disease of the whole urinary tract. Any operation that may be done is complicated by this depraved condition of the general health. This, of course, affects persons in both private and hospital practice. Death is, as has been stated, more frequent after the division of stricture in hospital than in private practice. This is due more to the fact that a skilful practitioner is not consulted at an early stage of the disorder, than to any peculiarity in the atmosphere of the hospital ward. Disastrous results are not all confined to hospital practice. He recalled a case in which a very distinguished surgeon had the misfortune to lose in private practice a patient whose stricture he had divided. The patient was in very favorable circumstances, and had what his surgeon considered a very slight stricture. He at first objected to any operation, because the stricture caused him very

little trouble. After some hesitation, he consented to have it divided. He died in a few days.

Urethral fever is something more than surgical fever, as his friend Dr. Gross had termed it. Surgical fever occurs even in the most healthy persons on account of some injury or surgical operation. It generally runs a very mild course, and is marked only by a slight rise in the pulse and temperature; whereas urethral fever is usually ushered in by marked chills and runs a rapid and dangerous course. The constitution of the patient is already impaired by disease of the urethra, bladder, and kidneys.

In studying the cause of so sudden a death as one of those related by his friend Dr. Brinton, we must not forget the possibility that it may be due to something else than the ordinary pathology of the disorder. For instance, some patients bear morphia very badly, and at times its exhibition is followed by very alarming symptoms.

As regards the influence exerted upon the pathology of stricture by the treatment of gradual dilatation, his own experience had been very favorable. It is the method of treatment which he preferred. All of the cases which he had been able to follow had been cured. A very marked case occurred to him nineteen or twenty years ago. He had charge of a very bad case of stricture, with numerous urinary fistulæ in the scrotum and perineum. The case was treated by gradual dilatation, and resulted in a perfect cure. He had the opportunity of seeing the patient recently, who has not used a catheter or bougie for many years, can pass a large stream, and has no difficulty whatever.

September 26th, 1878.

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13. *Suppuration in an old hydrocele with thickened walls—Excision of the mass.*

Presented by Dr. J. H. Packard.

J. L., æt. 64, was admitted to the Episcopal Hospital, November 20th, 1878, on account of a large and painful tumor of the left half of the scrotum. He looked fully the age which he gave, with a well-marked arcus senilis round both corneæ, but showed no other sign of ill health. He had formerly been a boiler-maker, but for a number of years had been obliged to take up less laborious work.

The source of the pain seemed to be partly the dragging weight of the

tumor, partly the irritation from friction of his clothes. No enlargement of lymphatic glands existed.

He stated that he had long had a hydrocele, which was first tapped thirty years ago and repeatedly since; the last time being about two years ago. He thought that the sac was not then fully emptied, "something like clots" remaining.

Active inflammation, resulting in abscess, and the discharge of a large amount of pus, required appropriate treatment before any operation for the removal of the tumor could be instituted. On the 14th of December, it being evident that this suppuration was superficial to the mass, and the skin being almost free of abnormal redness, excision was performed in the usual way.

Upon section the tumor was found to consist of an enormously thickened tunica vaginalis, the walls being in some places fully half an inch through. The cavity was full of thick creamy pus, and at its posterior part lay the testicle, to all appearance perfectly healthy.

After the operation the patient recovered rapidly, the discharge from the cavity left in the scrotum being at first very great, but soon lessening under the use of injections of carbolic acid, 1 part to 20 of water. The wound is now (December 26th) almost entirely healed.

Suppuration must be extremely rare in cases of hydrocele, since no author, so far as my knowledge goes, mentions it. I am therefore inclined to think that in the case now reported there was, on the occasion of the last tapping, a vessel wounded, and that a hæmatocele was thus formed, in which, from some pressure or other irritation, inflammation was set up and the contents converted into pus.

December 26th, 1878.

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d. MAMMARY GLAND.

14. *Unusual tumor of the breast, following confinement—Amputation—Recovery.*

By Dr. W. W. Keen.

Mrs. McC., æt. 30, was delivered of her first child, April 20th, 1878. Nothing of any special moment occurred, saving a tedious recovery by the bladder of its expulsive power. The catheter had to be used for over a week. During this time I watched the breasts, as usual, lest any danger of a mammary abscess should arise, but at no time was any lump de-

tected. In June she called to see me, when I found a lump at the upper part of the right breast, which she stated had been there for some three weeks. It was as large as an English walnut, and presented all the ordinary symptoms of a milk cake, except that it was indolent. During the summer, in consequence of inattention on her part and absence on my own, I saw her only at somewhat long intervals. The usual means to bring about resolution and, failing in this, to bring on suppuration were tried, but were all fruitless. Only one small superficial abscess formed and was opened, and that one was situated below and inside the nipple. Meantime the tumor had gradually invaded more and more of the breast, and by the middle of October had involved the whole of it. Soon after this a sudden inflammation appeared, and covered the chest, upper arm, and shoulder. It was not erysipelatous; was attended with considerable œdema and constitutional disturbance. Fearing suppuration behind the mammary gland as soon as the acute inflammation disappeared, which was in three or four days, I made an exploratory incision at the lower and outer edge of the breast which was the seat of greatest pain and tenderness, although no fluctuation could be discovered. The incision gave no evidence of pus, and healed in a week or ten days.

Early in November a consultation was had with Dr. Albert H. Smith, who confirmed my previously expressed opinion as to the advisability of amputation of the breast, which was done November 22d, 1878. At that time her condition was as follows:

Her general health had suffered but little. Her appetite and sleep were fair. The pain, which was never lancinating, was a dull, aching pain, partly attributable to weight. The breast was enlarged to about the size of the double fist. It was hard; pitted slightly, but perceptibly, on pressure; was inflamed; of a deep-red color; at points almost purple. The nipple was not retracted, but was considerably smaller and less evident than it had been. The skin was not movable over the breast, but was evidently involved by the tumor, especially in the upper (the older) part, where it was brawny. It was not ulcerated. The tumor was also evidently spreading beyond the limits of the gland towards the axilla. The breast was still movable over the subjacent muscles. None of the axillary glands were involved; nor were the mammary veins enlarged.

The breast was removed by two elliptical incisions, including the nipple and chiefly the skin below the nipple. No adhesions existed except at the site of the exploratory incision and where the tumor was extending towards the axilla. All of this was carefully dissected out. Its limits here were ill defined, but the rest of the tumor had a well-defined

margin exclusively limited to the mammary gland. The operation was done throughout with careful antiseptic precautions. Three arteries were tied with catgut, and, after inserting a drainage-tube traversing the entire depth of the wound, the edges were approximated by eleven wire sutures.

She reacted well. The urine had to be drawn for three days. On the 24th (two days after the operation), the first rise of temperature took place (101.4°). She ate, however, a good Christmas dinner, and in two days the temperature had fallen to 99°. A very scanty suppuration occurred after a few days, caused, I think, by a too-slow shortening of the drainage-tube, which was not entirely removed till the eighth day. It ceased immediately on its removal, and on the twelfth day the wound was entirely healed and the last sutures removed.

The tumor on section was hard, but did not creak under the knife. It was mottled-white, and apparently fibrous in its texture, and dotted here and there with small patches of fat. No evidence of suppuration existed at any point. It measured five inches in diameter and two inches in thickness. *December 26th*, 1878.

Report of the Committee on Morbid Growths:

"A histological examination of the tumor from the mammary gland, presented by Dr. Keen, shows it to be composed mostly of fibrillar connective tissue, with the atrophied acini of the gland, still retaining their epithelial lining, scattered through it. The new formation may be considered a peri-canalicular fibroma." *January 9th*, 1879.

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15. *Metastatic deposits in the pleura, lungs, thoracic glands, and kidney, from a patient who had atrophic scirrhus of the breast for seventeen years and a half.*

Presented by Dr. S. W. Gross.

The specimens exhibited to the Society were removed from a woman whose history, up to eighteen months before her death, is fully described in the *Philadelphia Medical Times*, vol. viii. p. 84. The primary growth, along with implication of the corresponding axillary lymphatic glands, made its appearance in a prolific female at the age of 46 years, or six years after the menopause. At the expiration of sixteen years the right mamma was not more than one-sixth of the volume of its fellow, which was small and flabby. It was converted into an irregular, densely hard,

and inelastic nodulated mass, which was closely adherent to the subjacent structures and to the skin, which was thin, finely injected, and ruddy, and the seat of several superficial ulcers, which were covered with crusts. The nipple formed a small elevation on a hard nodule. The axillary glands of the right side were converted into a dense circumscribed tumor as large as a walnut, which was firmly attached to the walls of the chest. The supraclavicular glands were slightly enlarged, and several glands were detected in the left axilla, which were first noticed four months previously. On the inner side of the withered breast, parallel with the median furrow of the chest, the skin was the seat of four shot-like nodules. The woman's general health was excellent, and she merely complained of sharp intermittent pains at the site of the excoriations.

From this time, May 12th, 1877, until the 27th of November, 1878, I lost sight of the patient, when through the kindness of Dr. J. M. Barton and Dr. G. A. Rex, who had seen her during the interval, I was enabled to be present at the post-mortem examination and secure the diseased gland, with a portion of the walls of the thorax and the attached right lung, the left lung, and the right kidney. For about twelve months before her decease she had suffered from cough, occasional slight hæmoptysis, oppressed breathing, and other signs of tubercle.

In addition to the appearances already described, the skin of the scapular and mammary regions was found to be occupied by several secondary growths, lenticular in shape, the largest of which were nearly half an inch wide and three-sixteenths of an inch in their greatest thickness. In addition to these, similar growths were observed in the skin of the left breast, two inches above the nipple and at the base of the ensiform cartilage. The pectoral muscles were also the seat of extensive deposits. The right parietal and visceral layers of the pleura were intimately adherent, and the lung was so closely attached that it was torn through in attempts to separate it from the inner surface of the chest. Both lungs were pervaded by tubercles, but especially the right, in the latter of which several small cavities were discovered. They were also filled with metastatic scirrhous deposits, which varied in size from a small shot to a cherry. The parietal pleura investing the diaphragm and lung of the left side was beset with a multitude of nodules, from the periphery of which numerous lines radiated, through intraction of the connective-tissue fibrils of that membrane, thereby presenting the appearance of the hub of a wheel with its diverging spokes. The bronchial and mediastinal glands were converted into scirrhous masses, and the right kidney was the seat of twelve superficial nodules. The remaining viscera were free from disease.

Microscopical examination of one of the larger nodules of the skin, and of the axillary glands, conducted with Dr. Shakespeare, revealed the usual appearances of scirrhous carcinoma. *December 26th*, 1878.

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16. *Recurrent round-celled sarcoma of the breast.*

By Dr. S. W. Gross.

A spinster, at the age of 49, perceived a small, hard nodule in the right mamma, which grew rapidly, ulcerated, and discharged a large quantity of bloody fluid, but the ulcer subsequently closed. It was mobile, bulky, and annoying from its size and weight, and when removed, along with the entire breast, at the end of two years, by Dr. John Ashhurst, Jr., who reported the case in the 5th volume of the "Transactions," p. 230, it was surrounded by a distinct capsule, and sent a prolongation beneath the pectoral muscle. It was a vegetating or intracanalicular sarcoma, and presented "in alternating preponderance rounding and fusiform cells." Dr. Ashhurst informs me that the patient left the hospital in a few weeks, with the wound united, and in apparently good health. She returned, however, in four months with a recurrence of the disease on the side of the chest below the axilla, but the tumor was so diffused and so adherent that further interference was not deemed advisable. On her admission into my ward of the Philadelphia Hospital, February 3d, 1876, or rather more than nine months after the extirpation of the breast, she was quite corpulent, but exhausted from the combined effects of the inhalation of the highly-offensive odor of the open mass, and a profuse hemorrhage which had occurred six days before. She also suffered from constant nausea, and vomiting of the ingesta; the right arm and the lower extremities were œdematous, and the face was decidedly yellow.

On the side of the chest, and extending over its anterior wall, and reaching to the summit of the axilla, was a foul, excessively fetid, undermined ulcer, filled with gangrenous-looking tissue. Its edges were ragged, but neither thickened nor indurated. Immediately below this, and separated from it by a bridge of skin, was a second but much smaller opening, and to the inner side of and below the latter there was a moderately firm, elastic tumor. At the midpoint of the axilla, as well as below it, were small ulcers, and commencing below its anterior fold were four tubers, each about an inch in diameter, which surrounded the large ulcer

on its inner side, and were ulcerated at their centres. The skin in the vicinity of the openings was livid, but the veins were not prominent.

These features are well exhibited in the specimen, which was removed after death, on the fourth day after her admission. The axillary lymphatic glands were not compromised; the vessels were surrounded by the soft material of the growth, but their lumina were free from invasion; the upper four external intercostal and the third and fourth internal intercostal muscles were the seat of extensive deposits, while the parietal pleura over the fifth, sixth, and seventh ribs and their corresponding interspaces was also occupied by small nodules. The right pleural sac was the seat of recent adhesions, and contained half a pint of serum, while the left contained two ounces of fluid. The lungs, the heart, the brain, and other viscera were healthy, except the liver, which was very fatty, and the gall-bladder was distended, the left kidney, which was cystic, and the right kidney, in which were many calculi, which varied in size from that of a French pea to that of a small bean.

Minute examination disclosed that the recurrent growth was a small round-celled sarcoma, containing some giant elements, and the absence of glandular structure afforded conclusive evidence that the entire breast had been removed by Dr. Ashhurst.

Dr. John Ashhurst, Jr., said that his experience led him to agree with the opinion expressed by Dr. Gross, and that he regarded these cysto-sarcomas of the breast as more malignant than any other variety of mammary tumor. Besides the patient, the termination of whose history Dr. Gross had just communicated to the Society, Dr. Ashhurst had operated upon another patient similarly affected. This was a colored woman, aged 40 years, suffering from an enormous tumor of the breast, the appearance of which was figured in the last edition of Dr. Ashhurst's "Surgery;" the weight of the tumor, after removal and after the evacuation of three very large cysts, which burst during the operation, was six pounds. The wound healed rapidly, but in a few weeks a small recurrent nodule was formed, not, however, involving the cicatrix, and was removed through a small incision. In about six months the patient again presented herself with multiple recurrent growths, but no operation was now considered advisable. She then fell into the hands of an irregular practitioner, and died not long afterwards, the duration of life after the first operation having been six weeks less than one year. Through the carelessness of an assistant, the tumor was unfortunately lost before it had been submitted to microscopical examination, but Dr. Ashhurst had no doubt that it was a sarcoma, probably of the round-celled or small spindle-celled va-

riety. The clinical histories of these two cases certainly showed a degree of malignancy rarely equalled in any example of mammary carcinoma.

February 13*th*, 1879.

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17. *Adenoid fibroma of the breast.*

Presented by Dr. S. W. Gross.

Dr. S. W. Gross exhibited a specimen of adenoid fibroma, which was removed by Dr. W. G. Porter from a lady 26 years of age, who first noticed it as a small lump, at the upper and inner circumference of the mamma, eight years previously. She had been married only a few months, and thought that its increase had been rapid during that time. It was freely movable, and painless throughout, and the skin and nipple were normal.

The tumor was flattened and ovoidal in form, and measured three inches and a half in length, three in breadth, and one inch and a half in thickness. It was lobulated, uniformly firm and somewhat elastic, enclosed in a thin capsule, and presented, on section, a coarse fibrous appearance, with a few dilated ducts. Attached to it, by a rather broad pedicle, was a second growth, of the volume of a small walnut.

The microscope revealed an abundant, for the most part mature, wavy, fibrous tissue, throughout which were interspersed numerous acini and ducts filled with epithelium. Some of them were becoming converted into cysts, through dilatation of their walls and mucoid transformation of the cells.

In his remarks on this specimen, Dr. Gross stated that minute examination of twenty-eight fibromas and sarcomas of the mamma had convinced him that, while the majority of the connective-tissue neoplasms contained lacteal glands, so that they are mostly mixed growths, the amount of persisting glandular tissue is proportionate to the chronicity of the tumor. In this specimen, for example, the acini were abundant, while in the fibroma exhibited by Dr. Keen during the past winter, which had attained a circumference of fifteen inches in six months, a large section disclosed only one enlarged and deformed lobule and a few dilated ducts.

March 27*th*, 1879.

18. *Case of ulcerated and fungous cystic tubular adenoma of the female breast.*

Presented by Dr. M. Longstreth. Notes by Dr. H. M. Fisher.

Mary W., admitted January 10th, 1879, under the care of Dr. Morton, into the Pennsylvania Hospital. Single; æt. 50; dressmaker; born in Ireland.

Her parents were healthy, and lived to an advanced age. A sister had a tumor of the breast, which was "burnt out with caustic," and she has had no return of the disease since. A brother has a "sore" on the cheek.

About eighteen years ago she first noticed a swelling of her left breast; this remained without appreciable increase in size, or without giving her any inconvenience, until seven or eight years ago. It then became much swollen after a course of sea-bathing. In four months it had swollen to a large size, and in about a year it burst and discharged a brownish watery fluid. The swelling then entirely disappeared, and during four months she was entirely free from any swelling of the breast. Four months later, however, another swelling occurred immediately beneath the seat of the previous swelling; it was also painless.

For about six years there was a constant slight discharge from the swelling. About four months previous to admission the swelling increased very rapidly, and the discharge had been much freer, and had become much more offensive.

According to her statement, it had not bled much except when she picked it, which she had done with the idea that free bleeding lessened the offensive odor. She has lost flesh and appetite during the last three or four months only. Has always been pale and thin.

Upon admission the patient was pale. There was a tumor as large as a child's head hanging from the outer side of left breast, moderately soft and somewhat lobulated. The surface was ulcerated, blackened, covered with black clotted blood, and purulent matter exuded from the surface. The lymphatic glands of neck and axilla seemed to be entirely free from enlargement. The odor exhaled from the mass was very offensive. On pressure, a bloody, watery fluid exuded in jets. The mass was movable on the thoracic wall.

January 11th, Dr. Morton removed the mass by a curvilinear incision about six inches in length. There was pretty free hemorrhage after the removal of the tumor, requiring six ligatures to control it. After the

operation there was considerable pain. In the evening, temperature 101.5° F.; pulse 106.

The wound healed rapidly by adhesion; there was very little discharge. She was discharged, February 6th, 1879, well.

The tumor, when handed to me after removal for examination, had a very offensive odor, due to the decomposing blood and matters contained in it. Its surface was uneven and nodulated, and of a black color; by slight pressure, there flowed from it a thick bloody fluid. The greater part of the surface showed the results of ulceration, and was covered by thick, dry crusts of tissues. Towards the base of the tumor, the skin covering it had a purplish color; at the border, towards the ulcerated part of the tumor, the skin was elevated by cysts or sinuses beneath it filled with blood, which, by pressure, could be emptied, immediately refilling when the finger was removed. The diameter of the tumor at the level of the chest-wall was about three inches, whilst the fungous mass at a level two inches higher (about one-third of the distance to its summit) had a diameter of about six inches. The depth of the tumor, from its most prominent point to its base, was nearly six inches. The anterior surface was flattened, but irregular, due to ulcerative destruction of the part, thus giving the mass the form of an oblong flattened sphere, the greatest diameter being transverse.

The fungoid mass, therefore, overhung and partly concealed the skin covering the deeper parts of the tumor. On raising up the mass, a deep pit large enough to hold the point of the index-finger was found on the inner side, concealed in the fold between the tumor and the skin. This depression was found to be due to the retraction of the nipple. The usual coloration of the nipple and its areola was lost in the purplish hue of the skin at this part of the growth.

On making a deep section of the tumor, carried from its most projecting point nearly to the base, tissues of varying appearance were brought to view. First, the surface was found to consist, in parts, of skin, dead, dry, infiltrated, and blackened by blood-coloring matters; other parts of the skin covering the mass had ulcerated and been removed, the crust covering the deeper parts consisting of dried tissues equally blood-stained and black. Beneath this surface were found cavities in the tissues filled with blood-colored fluid; the size of the cavities varied from minute pin-head-sized cysts to large openings capable of holding a small walnut; the contents of these cavities varied somewhat in consistence, but were thin and serous, quickly flowing away on section.

Deeper, the cysts were large in size, but were separated by thicker

bands or masses of tissue. More superficially, the walls of the cysts were thin and membranous; deeper, the tissues surrounding the cavities were firm and flesh-like, and, like all the tissues in this part of the tumor, stained of a deep-red color.

On reaching the lower third of the section, tissues of an opaque-white color were reached, which, on the surface of the section, appeared like gland-tissue; from them exuded a thin, semi-transparent, whitish fluid. The consistence of this part was about that of the tissue found in a normal mammary gland, but somewhat more elastic. There was no distinct demarcation between the cystic portion and that found lower in the section; the consistence and the color of the two parts were entirely unlike, but no capsule or fibrous band separated them distinctly.

On inspection of the base of the tumor, some adipose and muscular tissues were found covering the mass; they were of normal appearance. Resting on them were found the lobulated masses of the tumor, having the same color and consistence as the tissue composing the deeper parts of the section above described.

These lobules of the tumor were covered and separated from the adjacent lobules by a thin, shining, fibrous capsule, which was not adherent (or only loosely so) to the submammary tissues. Several large vascular trunks were seen penetrating its base, and taking a course especially towards the outer or fungoid portion of the mass.

Sections made with the freezing microtome, without hardening, from different portions of the neoplasm, were examined by Dr. S. W. Gross, to whom I am indebted for the following report:

"The entire lower third of the tumor was composed partly of dilated and deformed and, here and there, confluent acini, the membrana propria of which was perfect, and lined with regular columnar epithelium, and packed with polymorphous cells, which had undergone fatty degeneration at the centre of some and mucoid changes at the centre of others. In a few there were vegetations, made up of delicate connective tissue, and covered with columnar epithelium. In addition to the changes in the size and form of the acini, and the proliferation of their epithelium, excessively elongated, but only moderately wide, tubules pervaded the sections to such an extent that they greatly preponderated throughout the entire growth. Some were fusiform, but the majority were irregular in their outline, being alternately contracted and dilated, like a row of ovoid beads. They pursued, as a rule, a parallel course, but they now and then divided and intercommunicated, and some at several points were in direct connection with the altered acini, of which, indeed, they

were merely outgrowths or prolongations, so that from one acinus I counted nine offshoots. They all retained their proper membrane invested by columnar epithelium, and the majority preserved their lumen throughout, although they frequently terminated in attenuated solid processes, which not uncommonly were curved or turned upon themselves. The intertubular connective tissue was very sparse in quantity, so much so, indeed, that on transverse section the ducts were so closely crowded together that their limiting membranes appeared to be in contact with one another. There were also a few areas of the normal, dense fibrous tissue, into which the ducts were extending. Sections of the 'fleshy part of the fungus' were so obscured by a small-cell infiltration that little else was to be observed, save enlarged ducts and acini which had undergone cystic changes; while a section of the 'skin near the ulcerated margin of the tumor' disclosed that it was the seat of chronic inflammatory changes. From these considerations I would classify the neoplasm as a cystic tubular adenoma," a form of tumor which is so rare that the only other example on record is that described by Billroth.*

March 27th, 1879.

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19. *Scirrhus of the male breast.*

Presented by Dr. S. W. Gross.

A German, 59 years of age, first noticed, a year ago, a firm swelling of the right breast, which gradually but painlessly increased in size until it formed a densely-hard nodular tumor, which measured upwards of an inch in diameter, and projected about six lines above the surface. The skin was red and excoriated, and covered, for the most part, with a crust, from the application of a salve, but the nipple was not retracted. In the centre of the axilla were two glands, closely connected with each other, which were first detected about six weeks ago. He was a small, muscular, healthy subject, and there was no history of cancer in his family.

The diseased structures were removed by Professor Gross, on the 4th of March, 1879. The entire mamma was converted into a lenticular tumor, an inch and a quarter in length by three-fourths of an inch in its greatest thickness, the cut surfaces of which were concave from above downwards, and of a delicate rosaceous-white tint, traversed by nacreous

* Langenbeck's Archiv, vol. vii. p. 861.

white bands. The larger lymphatic gland was elastic, and three-quarters of an inch in diameter. Its capsule was very vascular, and its substance was grayish-white, and mottled with blood-extravasations and yellowish-white granular points. The smaller gland was densely hard, of a whitish hue, and about one-third of an inch in diameter.

Examination of frozen and stained sections disclosed that the connective-tissue framework of the mamma was infiltrated by small, round cells, and pervaded by variously-shaped, simple or branched, solid cell-cylinders, which, on transverse section, looked like choked ducts; so that the growth is to be classed as a tubular carcinoma. Although the cells, *in situ*, could not be distinguished from white blood-corpuscles or the ordinary products of connective-tissue hyperplasia, scrapings of the cut surfaces of the tumor proved them to be polymorphous, and of an epithelial

$\frac{180}{1}$ reduced one-half.

type. In addition to these appearances, there were many enlarged and deformed acini, more or less closely packed with small cells of the same character, the undermost layer of which, however, was columnar, and rested upon the thickened membrana propria, the endothelial cells of

which were increased in size and number. Immediately adjacent to some acini, and entirely distinct from them, were epithelial plugs; around others the plugs were encroaching upon the acini; while in others, at one or more points, the membrana propria had disappeared, and the cells of the acini were prolonging themselves into the surrounding lymph spaces, to fuse with the mobile cells contained in them. These appearances are shown in the drawing, for which I am indebted to Dr. E. O. Shakespeare, *a*, *b*, and *c* representing three enlarged and more or less closely packed acini, from the upper and lower of which the epithelium is extending itself into the lymph spaces, as may be seen at the inferior circumference, to the right. The smaller bodies represent solid cell-cylinders, which are the outgrowths of other acini, while the cells themselves are merely represented by their stained nuclei. Whether the morbid process originated within the acini, and the cell-cylinders were to be regarded as deformed acini prolonged into the lymph spaces, or whether, on the other hand, there was simultaneous heteroplasia of the connective-tissue corpuscles and of the glandular epithelium, the products of which subsequently united through the disappearance or destruction of the membrana propria, was not easy of determination. On the whole, however, I am disposed to regard the neoplasm as being of epithelial origin.

The larger lymphatic gland, in addition to being the seat of irritative changes, was, for the most part, converted into an exquisite carcinomatous structure of the ordinary type, as indicated by the formation of new connective tissue, which enclosed ovoid or roundish spaces filled with epithelial cells. In the smaller gland it appeared as if the structure of the primary growth was reproduced, as the cell-accumulations were mainly tubular or cylindrical.

Records of scirrhus of the male breast are so rare that I may be excused for referring to two cases in which the minute appearances are detailed. In one from the practice of Wagstaffe,*—and it is the more interesting, as both mammæ of a man of 61 years were affected,—Dr. Creighton,† who studied the growths, describes the firmer one as being composed solely of greatly-enlarged and deformed acini, filled with polyhedric or normal epithelium, and contained in a coarse fibrous or chronic inflammation stroma, while the softer one was undergoing caseation of detached cells within the acini. In the second example, reported by Wood,‡ the structure was that of ordinary carcinoma, the alveoli being

* Trans. Path. Soc. London, vol. xxvii. p. 234.

† Ibid., and Contributions to the Physiology and Pathology of the Breast, p. 145.

‡ Trans. Path. Soc. London, vol. xxv. p. 223.

filled with large, irregular-shaped cells; but it differed from the specimens just described, in that the vessels of the stroma projected as highly-vascular buds or villous processes into many of the alveoli, which were also the seat of blood-extravasations through rupture of the vessels. It was removed from a gentleman 60 years of age, and had been the source of occasional bloody discharge from the nipple.

It will be observed that these three illustrations of carcinoma of the male mamma are very unlike in their minute characters. That examined by myself is a true scirrhous, fibrous, or tubular growth, and corresponds to the ordinary type of the affection. The specimen of Wagstaffe was one of acinous tumor, and was peculiar in representing a purely hyperplastic process, as the enlarged acini were filled with normal epithelium, through which it might rather be regarded as an adenoma; while that of Wood was a telangiectatic carcinoma, which is synonymous with the erectile or hematoid variety of Cornil and Ranvier; but it is, so far as I am aware, unique, in that the vascular tufts were associated with hard instead of with soft or medullary carcinoma.

It is possible that these cases represent different stages of development, and that they afford a clue to the point of origin of carcinoma of the breast. In that of Wagstaffe, the changes were limited to simple multiplication of normal epithelial cells, with enlargement and deformity of the acini. In my own case, which, in parts, may be said to represent the second stage, the dilated acini were filled with atypical cells, and they were evidently extending themselves as tubular prolongations into the lymph spaces. In the example of Wood the metamorphosis was complete, the alveolar structure being due to the fusion of the epithelial cells of the acini with the small-celled infiltrate of the periacinous connective tissue.

Scirrhus of the male mamma is so infrequent when compared with the female breast,—the proportion, according to Paget's and my own observations, being as two to ninety-eight,—that I take this opportunity of showing you an example of the affection in this man, who is 63 years of age. About five years ago his attention was attracted to the nipple by its being the seat of itching, when he scratched off a thick crust of epidermis, which he describes as resembling a pearl button. The scab reformed, and was removed from time to time, but the nipple beneath it does not appear to have been sore or red. Last June he was struck over the breast, and two months subsequently he accidentally found that the nipple was excoriated. Four months ago he noticed that the mamma was nearly or quite as large as it is now; but he observed that the axil-

lary glands were enlarged about eight weeks before he received the blow. The left mammary gland is converted into a hard discoid tumor an inch and a quarter in diameter, and its centre is occupied by a superficial ulcer, which has destroyed the nipple, and measures five-eighths of an inch transversely and three-eighths of an inch vertically. Its lower edge is inverted, puckered, and hard; its base is partly covered by a soft crust; and the skin is elevated into slight ridges, which radiate from its circumference. At a distance of two inches from the tumor there is an enlarged lymphatic gland on the side of the chest, over the fifth rib, while there is a large cluster of indurated glands high up in the axilla. His general health is excellent, the growth has never caused him the slightest pain or other inconvenience, and there is no history of carcinoma in his family.

This case is of great interest, as it elucidates a practical point in the pathogenesis of carcinoma of the mamma,—namely, that it is often preceded by and attributable to certain chronic affections of the nipple and areola, to which attention was first directed by Sir James Paget,* and has since been observed by Busch,† of Bonn. The cases of Paget, fifteen in number, occurred in women, varying in age from 40 to 60 years, in the majority of which the nipple or areola was the seat of an intensely red, very finely granular raw surface, discharging a copious, clear, yellowish, viscid fluid, and attended with a tingling, itching, or burning sensation. In some the eruption presented the ordinary characters of chronic eczema, while in others it was dry like psoriasis. In none of the cases was the appearance of the carcinoma delayed beyond two years, and it usually followed within one year; while the development of the disease was not primarily in the skin, but in the substance of the gland, beneath or not far from the affected skin, and always with a clear interval of apparently healthy tissue.

With the view of determining whether there is any real connection between chronic eczema of the nipple and areola and carcinoma, Mr. Butlin‡ examined two breasts which were the seat of the former disease, and found that, in addition to the ordinary changes produced in the skin by eczema, the ducts were widely distended, and contained, frequently, large masses of squamous epithelium, and that the connective tissue was infiltrated with small cells. In an induration, which existed in one of

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* St. Bartholomew's Hospital Reports, vol. x. p. 87.

† Langenbeck's Archiv, vol. xxi. p. 687.

‡ Med.-Chir. Trans., vol. lix. p. 107.

the breasts, the acini were also found to be enlarged and filled with epithelium. Although there was no carcinoma in either case, these facts indicate the commencement of morbid processes which lead to the development of that affection. Continuing his investigations, Mr. Butlin,* a year subsequently, described the minute anatomy of two instances of scirrhus of the mamma which were preceded by eczema. In both, the tissues between the neoplasm and the areola were somewhat indurated, and the appearances were the same as were present in the former cases, with the addition, in one, of cell-nests in the thickened portions of the areola and nipple, and of "much greater enlargement of the acini and ducts in the centre of the carcinoma than in the previous cases, so that they had become confluent, and their contents had made their way into the surrounding tissues." From these four cases Mr. Butlin concludes that eczema is an exciting cause of scirrhus through primary heteroplasia of the epithelium of the ducts, along which the disease travels to reach the acini and smaller canals. *March 27th*, 1879.

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20. *Unexplainable tumor of mammary gland.*

Presented by Dr. J. E. Garretson.

The tumor upon the table is, I presume, what the examining committee will denominate, in histological language, collonema. The growth, as will be seen on examining it, is about the size of a pullet's egg; it is soft and friable; it very much resembles glue. The situation occupied by it on the body is the location shown in the specimen, being the right mammary gland, a little to the left of its vertical centre.

Clinically, the tumor impressed the touch as being a scirrhoma. It was hard, nodulated, movable. The history of it began in a nodule accidentally discovered. Three years has been the length of time required to gain its present bulk.

The interest attached to this growth, so far as I myself am concerned, lies not farther in the histological direction than suffices to enable me to know it as a neoplasm,—in other words, as a something about which I know myself to be profoundly ignorant; in still other words, as an abnormality which has in itself no anatomical or physiologico-pathological data which enable me to understand and rationally treat it. It is an un-

* Med.-Chir. Trans., vol. lx. p. 153.

explainable tumor, in contrast with a hundred others that I feel I know a good deal about,—hernial tumors, for example; odontoceles, hydroceles, ranulæ, sebaceous cysts, etc. It is one of a class of tumors that I am not any wiser about than when, twenty years ago, I commenced to study these things. Not but what I have somewhat enlarged my vocabulary in the direction of big words, but I am compelled to the admission that I have not yet found myself enabled to learn of a clinical difference between fibroma and encephaloma,—that is to say, I treat the latter by the mechanical act of cutting it away from the body, and that is the way, too, that I treat the former. A hernia, on the contrary, I reduce; a hydrocele I puncture; for the cure of an odontocele I pull out the tooth that is the offence.

The histological study of what I have taken the liberty to designate as unknown tumors—that is, every tumor which has not in itself its own explanation; all that kind of tumors of which the fibro-plastic is the type—seems to me to lead to little outside of the gratification of a kind of optical ambition, if it lead not to turning the microscope in the direction of the arcana of cause. There is, for example, a vice erratically, and without reason, called carcinoma. The specimen upon the table is an illustration of it. Were the specimen a myxoma, it would still be an illustration of it. Were it a fibroma of simple concentric development, I would accept it, from lack of better information, as a spoke of the same wheel. Can histological study find out the reason for a fibroma as it finds explanation of a sebaceous cyst? Can it find out why a simple fibroma, when removed, may come back with great increase in the cellular element? Can it explain why a myxoma, which is a fibro-plastic growth, returns, when extirpated, as sarcoma or as encephaloma? One true good, certainly, is to be credited to this study; it has demonstrated that no diagnostic skill can point the line of demarcation between fibroma and encephaloma.

I have brought the specimen to the table, not, of course, with the idea of showing anything different from what is seen here every meeting-night, but in a sense of personal weakness of judgment in the direction in which it leads. At the last meeting of the Society I presumed to criticise the practice of one of the members from the stand-point of what I deem to be a reasonably solid footing. At this present meeting I desire to acknowledge *myself* exposed, and this for the reason that, after three years of study in the case before us, I am not clear in my mind that the course pursued has been the best one. Can the practice which shows a nodule let alone for three years; a marriage permitted; a baby

allowed to feed nine months at a diseased breast; finally, the milk dried up and the gland amputated,—can this practice be faulted by any experience wider than that which has influenced the course pursued?

Dr. H. Lenox Hodge stated, in answer to the questions of Dr. Garretson, that in a case of a tumor of this character he would consent to marriage. The growth, if let alone, would probably increase in size during lactation, on account of the larger amount of blood going at that period to the breast. As the tumor was distinct and separate from the proper structure of the mammary gland, no injury to the child was to be anticipated. If there was any tendency hereafter to the development of such a growth in the child, it would probably be due to inheritance at the time of conception, rather than to nursing at the breast.

May 22d, 1879.

Report of the Committee on Morbid Growths:

"The mammary tumor presented by Dr. Garretson is found to consist, histologically, of round-, oval-, spindle-, and stellate-shaped cells, in which a relatively large nucleus is seen; an intercellular substance, partly fibrous and partly structureless or granular, is present. Here and there through the nodule are observed the atrophied ducts and acini of the gland; the ducts, when seen in transverse section, are found to have their lumen obliterated by a proliferation of the lining cells.

"A section taken from the gland in the proximity of the tumor shows a slight infiltration, of a similar new formation, into the glandular tissue.

"The tumor may be considered as myxomatous in nature. There is also an infiltration of the surrounding tissue by the myxomatous element."

June 26th, 1879.

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21. *Scirrhoma of breast and axillary glands.*

Presented by Dr. James E. Garretson.

The specimen shown consists of a left mammary gland and a chain of lymphatic vessels and glands taken from the person of a lady aged about 50.

The mamma, enlarged to thrice its ordinary size, very hard, showing, on section, the stroma like a turnip, was amputated, six weeks back, by Dr. Markley, of Hatboro', in this State. At the time of operation, the disease had not extended its boundaries beyond the body removed.

Sunday, June 15th, being in the neighborhood for the purpose of doing

an operation for a patient under Dr. Markley's medical care, my attention was called to the case under description.

As seen at this visit, the wound previously made was found fairly healed. At the seat, however, where the uniting process had been best completed, there was found an indurated mass about the size of a hen's egg. No involved neighboring glands exposed their presence to the touch.

Sunday, June 22d, by engagement, I met Dr. Markley at the house of the patient, for the purpose of doing a second operation. Examination was made for axillary involvement, but nothing exposed itself.

Commencing the operation by a cut that should lay bare the pectoral muscle, and dissecting the mass from that muscle, it was found connected with a second involvement lying just below the free edge. This, in turn, was connected with another body, and so on one after another, until the large number here shown were dissected from the region of the armpit and neighboring parts. The extent of involvement I offer as a rare one in my own experience. I have never before removed, nor have happened to see removed, so many glands from this region. The number of those here shown is twenty-two; at least half a dozen were not saved.

A postal received this afternoon at three o'clock, from Dr. Markley, reads as follows:

"Have seen Mrs. G. this A.M. She rested well last night. Pulse reduced to 112, with all indications favorable." *June 26th*, 1879.

VI.—THE NERVOUS SYSTEM.

1. *Tumor of the brain, involving portions of the first and second frontal convolutions, convolution of the corpus callosum, and corpus callosum.*

Presented by Dr. Charles K. Mills.

The following case is worthy of study as a remarkable example of brain-tumor, and it is also of special interest, owing to its situation, at this time, when the localization of cerebral functions and lesions is attracting such wide-spread attention.

R. D., æt. 35, a house-painter, was admitted to the Philadelphia Hospital, September 16th, 1878. He was an active local politician, and for a few years had been intemperate. Six years before coming under observation he had had a chancre, which was not followed by secondary symptoms. Fifteen months before, while intoxicated, he had fallen from a high door-step to the street, striking on his head. He was first known to be sick about two months subsequent to this accident, when, after a spell of heavy drinking, he was attacked with vomiting and severe headache. After this his health began steadily to decline. For about nine months before coming under my care he was an inmate of the Pennsylvania Hospital. Some facts of interest in regard to his previous history were obtained from his friends, as follows:

He suffered from persistent headache, aggravated at night. He had apparent loss of power in the limbs, particularly of the left side. His sight gradually failed, until he became blind, first in the right eye, and afterwards in the left. Mental hebetude and uncertainty, with some tendency to hallucinations, had been observed. Spasmodic contractions, especially in the muscles of the neck, forearm, and eyes, had been noted by some of his physicians. Oscillation of the eyeballs, or nystagmus, had also been a symptom. He had had involuntary discharges. Some interesting negative points were the following: vomiting had never recurred; he had not had marked fever; he had no history of aphasia, vertigo, or convulsions; and no paralysis of the muscles supplied by cranial nerves had ever been present.

After admission to the Philadelphia Hospital he was carefully examined by me on a number of occasions. He usually lay in a fixed position on his back, his head thrown backwards, and his face looking upwards and forwards. He was not emaciated, the muscles generally being in fair condition. Fæces and urine were passed involuntarily. His bowels, however, usually remained closed for two or three days; but when opened he did not appear to be aware of the fact. He would eat and drink at any and all times, and was never satisfied. None of the facial muscles were paralyzed. He protruded his tongue, which was red and corrugated, in a slow and hesitating manner. Smell was defective, but taste seemed to be preserved. He was blind, and suffered considerably from ocular trouble.

Dr. E. O. Shakespeare, ophthalmologist to the Hospital, was called in to examine and care for his eyes. Through his kindness, I have the following report: "At my first examination the condition of the patient's eyes was as follows. Both eyes were wide open. He had no perception of light. The movements of the lids and balls were preserved. The bulbar conjunctivæ were very slightly injected, the corneæ clear. The pupils were moderately and symmetrically dilated; they did not respond to varying quantities of light. The sensibility of the corneæ was possibly a little lowered. The ophthalmoscope determined the media to be clear, the outline of the papilla in each eye to be invisible, and the disks to be greatly swollen and of an opaque, yellowish-white color. The surface of the latter, and of the surrounding retina, was spotted with numerous minute linear and punctate hemorrhages. The arteries of the disk and retina were a little smaller than normal, and wavy in their course, here and there curving down among the opaque fibres and becoming invisible. The veins were very full and tortuous; they also were frequently lost to sight where they plunged deeply into the opaque nerve or retina. Great difficulty was experienced in getting a view of the fundus, on account of the movements of the eyes and the head of the patient, who had to be examined while in the recumbent posture. For these reasons the prominence of the optic papillæ could not be measured.

"Ten days after the foregoing notes were taken, the central corneal epithelium of the left eye became hazy, the whole bulbar conjunctiva much congested. This condition soon developed into a severe superficial corneitis, which was mainly limited to a central area of an extent about equal to three-fourths of the diameter of the cornea, which threatened to slough, a narrow peripheral ring of the cornea being comparatively unaffected. At the same time the engorgement of the bulbar

conjunctiva increased. The sclera, the iris, and the deeper parts were apparently not involved in the inflammatory process. The progress of the keratitis was kept pretty well under control by the use of atropia, of a hot chamomile poultice applied for fifteen minutes every four hours, and of a compress-bandage during the intervals. The condition of the right eye had not visibly changed since the first examination."

I have nothing to add to these notes of Dr. Shakespeare, except that the eyes remained in about the same condition described in the latter part of the report until the death of the patient.

He retained all movements of both hands and arms, but they were wanting in strength and accuracy. The left arm and hand were weaker than the right. With the left hand he marked 5° on Mathieu's dynamometer, with the right 25°; but these numbers probably did not represent with exactness his grip, as he could scarcely be made to understand what was desired of him. He frequently carried both hands to his forehead, and he was sometimes found fumbling with one or both about the penis or scrotum. His legs were usually kept extended and motionless, but sometimes they were found drawn up, with the thighs semiflexed on the body, and the legs on the thighs, when they could only be straightened with difficulty. I could not succeed in making him kick or perform any movements with his legs or feet, although they would sometimes move as if by accident. On taking hold of them, and attempting flexions, extensions, etc., he would appear to resist such exertions with much force. Farado-contractility was retained.

Sensation did not appear to be affected, although exact determinations were difficult, owing to the patient's condition.

The psychical manifestations were among the most important features of the case. Although comparatively uneducated, he had been when in health intelligent and energetic. He had never during his illness had the gay humor or delirium of grandeur seen in the general paralysis of the insane. His condition, on the whole, was one of intellectual slowness and uncertainty. He seemed to have great difficulty in receiving mental impressions and in directing the movements of his body. His faculty of attention was, in great measure, destroyed. It could only be fixed, and then but partially, by distinctly and vehemently repeating a question or command. He could hear, but it was necessary to make a tremendous external impression on his sense of hearing in order to call out a mental response. He sometimes appeared to me like a man dazed by a great catastrophe which he could not understand.

He was not aphasic, although he manifested certain striking peculiari-

ties of speech, or, rather, of the manner of speaking. What he said, either spontaneously or in answer to questions, was spoken clearly and distinctly, and in a firm, loud voice. His sentences were short, but complete; neither words nor syllables were omitted; and he made no mistakes in articulation, enunciation, or pronunciation. In answering he did not seem to be able to retain for any length of time a hold upon the same idea or to follow a particular train of thought. He did not wander from one subject to another, but he would suddenly stop speaking, as if unable to go further. Often on being questioned he would try to reply, and, after a sentence or two, would sob and burst into tears like a violently hysterical woman. He would at times have what might be termed volcanic outbursts of speech. When all was perfectly quiet in the ward, he would suddenly explode with a sentence or two, and then again subside into stillness. Exclamations of this kind might be repeated at intervals of a few minutes for hours together, or they might recur only at intervals of hours. Sometimes what he said would be connected with some past events of which he seemed to have a vague recollection; often it would be a demand for something to eat or drink; and often, again, it would be a paroxysm of profanity.

His pulse ranged, for the most part, between 78 and 100, varying with the temperature, which will be referred to hereafter.

In regard to treatment I will be very brief. The fact that the man was doomed was, of course, at once recognized. He had before coming into my hands been treated heroically, but without avail, with iodide of potassium. My efforts were directed particularly to making him comfortable,—to relieving his headache, quieting his mind, preventing bed-sores, and caring for his eyes. Blood was taken from the temporal regions by means of leeches. Bromide of potassium was used in large doses. Cannabis indica, both in the form of tincture and alcoholic extract, was administered. Morphia was also employed at intervals. Solutions of sulphate of atropia were chiefly relied upon in treating the inflamed eyes.

He gradually grew weaker and less demonstrative, and died quietly, apparently from exhaustion, October 16th, 1878.

A *post-mortem* examination was made six hours after death. The body was not emaciated. No external appearances of interest were noted, except an opacity of the left cornea. No abnormalities of the skull, or of the soft parts covering it, were discovered. A large quantity of blood poured from a point just anterior to the middle of the longitudinal fissure. The cerebral veins and sinuses were filled with blood. Superficially everywhere were evidences of true congestion.

Looking at the brain from above, a large, bloody-looking tumor was seen lying obliquely across the right frontal lobe, in a direction from before backwards and from without inwards. It was so situated that it had involved and destroyed, in its process of growth, the anterior upper half of the first frontal convolution, and the anterior upper and inner half of the second frontal. It had also removed a small segment of the gyrus fornicatus, or convolution of the corpus callosum just where it bends around the genu of the corpus callosum; and finally, a low stratum of the tumor had invaded the anterior portion of the corpus callosum itself, for a distance of half an inch, the diseased mass barely touching the inner side of the gyrus fornicatus of the opposite hemisphere.

The tumor was overlapped towards the outside and posteriorly by portions of the first and second frontal convolutions, and it did not, therefore, encroach upon either the third or the ascending frontal convolution. Its greatest height was at about the line of the upper frontal fissure, which separates the first and second frontal convolutions, where it was on a level with the surface of the convolutions of the opposite side. The hemispheres were thrust widely apart, especially towards the front. The membranes over the tumor were destroyed. On turning the brain over, and examining the base, no signs of the growth could be found. The contours of the gyrus rectus, or first frontal convolution below, and of the second and third convolutions inferiorly, were preserved.

On closely examining the tumor after removal from the brain, it was found to have an irregular nodulated or lobulated surface and pyriform shape, its small end constituting the part which had extended to the anterior part of the corpus callosum. On making a central incision lengthwise, it was found to be very firm, dense, and resisting, and the cut surface presented a mottled, reddish appearance. It measured three and one-half inches in length, by three inches in width and two and one-half inches in depth.

No evidences of meningitis were found, although the pia mater was somewhat injected, especially near the tumor. Nothing abnormal was discovered in connection with any of the cranial nerves, except the optic, which will be referred to later. The lateral ventricle and the fourth ventricle contained a few drops of blood. The choroid plexus and vessels of the velum were engorged and of a dark-red color. The corpora striata and optic thalami, particularly of the right side, were congested, vessels standing out very prominently. The tubercula quadrigemina were red. The brain, as a whole, was firm and consistent. It weighed, including the tumor, the unusual amount of sixty-two ounces. The weight of the tumor

was seven ounces. The pons, medulla oblongata, cerebellum, and parts of the brain not mentioned above showed nothing abnormal. In comparison with the general cerebral mass, the cerebellum was smaller than usual.

As circumstances which could not be controlled rendered it necessary to perform the autopsy in a limited time, a careful general examination of the body could not be made. The lungs, however, were found to be healthy, and the heart large and surrounded by an unusual amount of fat, but it showed no valvular lesions.

A fragment of the tumor, and the eyes, which were carefully removed, were referred to Dr. E. O. Shakespeare. Sections of the tumor were also examined by myself.

Dr. Shakespeare made the following report:

"Thin sections of the tumor, after staining with carmine and mounting in glycerin, when placed under the microscope showed a ground formed entirely of bundles of white fibrous tissue running in various directions. The small quantity of loose connective tissue between the bundles exhibited an abundant infiltration of embryonal cells. Between and upon the fibres constituting the bundles, the flat cells normally found in such position were in a slight state of proliferation. They were rather more numerous and were more swollen than usual, but when seen in profile they appeared thin and spindle-form, and when viewed in face they were seen to be flat. The blood-vessels were not numerous; their walls preserved a greater abundance of cells than do those of normal tendinous tissue. The growth in question was, therefore, a *fibroma*, whose tissue was in a state of hypernutrition, that is, that of irritation or increase.

"Microscopical examination of the pons and medulla oblongata determined unmistakably the presence of degenerative changes, chiefly sclerotic.

"Sections of the outer half of the cornea of the left eye, made vertical to the surface of the cornea, proved the ciliary body and iris to be normal; as was also the sclera, excepting that the vessels which form an anastomosis near the rim of the cornea, between the vessels of the sclera and those of the conjunctiva, were slightly engorged. Those of the conjunctiva were greatly engorged, and the conjunctival connective tissue near the vessels was the seat of a slight cell increase. A small distance within the rim, the cornea revealed a loss of the anterior layers of the epithelium. The deep layer of cylindrical cells was ruptured here by a line, two or three rows deep, of embryonal cells and pus-corpuscles. The corresponding anterior layers of corneal fibrous tissue were softened, and their corneal spaces were occupied by two, four, or more embryonal

cells in a state of fatty degeneration. The posterior layers of corneal fibres were apparently not invaded by the morbid process.

"Sections from the posterior part of the eye, at the entrance of the optic nerve and parallel with its axis, showed the sub-vaginal space much widened, and only partially filled with the loose cellular tissue usually found in it. This tissue was in a state of active cell proliferation. The optic papillæ were greatly swollen, and their surface was far anterior to the normal level of the disks. The capillary vessels of the disks and the adjoining retina were much more numerous than usual, and were dilated. Their walls and the interfibrillar connective tissue were much more richly supplied with small cells than when in the normal condition. Numerous blood-extravasations were visible. In short, the sections presented those appearances usually encountered in choked disk."

Remarks.—This case may possibly afford some assistance in the solution of the question of the functions of the antero-frontal lobes. Pathology and physiology have not contributed much that is satisfying in regard to this region. In Dr. Bigelow's often-quoted "crow-bar case," a bar of iron passed through the left frontal region of the brain, and, it is said, without leaving any special symptoms. Trousseau, according to Ferrier ("Functions of the Brain," p. 125), relates the case of an officer who was shot through the head by a bullet, which traversed the anterior part of the brain, and who yet sustained little or no apparent damage bodily or mentally. The *London Medical Record* for April 15th and June 15th, 1877, contains a résumé by Ferrier of a paper by Charcot and Pitres on cerebral localization (*Revue Mensuelle de Médecine et de Chirurgie*, January, 1877), in which reference is made to some cases of lesions of the antero-frontal districts, the regions chiefly of the first and second and frontal convolutions. Speaking of the occurrence of wounds of the brain without causing either paralytic or convulsive phenomena, they refer first to the American crow-bar case, and to two similar cases of their own. A case was reported by M. Marot to the Société de Biologie, in which, as the result of a fracture of the right frontal bone, the upper part of the first right frontal convolution was lacerated. The patient died of pyæmia, without having exhibited motor symptoms. In a case of M. Baraduc's, both frontal lobes were greatly disorganized, the patient losing will-power and spontaneity, going about in a purposeless manner. In a case of Charcot and Pitres, a clot the size of a nut was situated on the second right frontal convolution, and caused no motor symptoms. In still another, recorded by Andral, softening of the orbital lobule caused general feebleness and defective intelligence, but left motion

and sensation intact. From these cases Charcot and Pitres conclude that destructive lesions of the antero-frontal region may exist without producing the slightest motor disturbance. They also note that these lesions cause no secondary degeneration of the spinal cord.

The size, character, and well-defined limits of the lesion recorded in this paper, with the somewhat full clinical history, render the case on the whole, I believe, one of great value in this discussion of the functions of the antero-frontal lobe.

Much general disturbance of the brain, and compression of parts not affected directly by the tumor, may have been produced by the growth; but, even admitting this, peculiar phenomena, depending upon the position of the mass and the destruction of convolutions caused by it, must, I think, have been present.

Ferrier ("Functions of the Brain," p. 230), in his experiments on the antero-frontal regions of the brain of the monkey, generally obtained negative results. Electrical irritation usually caused no special manifestations. Removal or destruction was not followed by any definite physiological results. The animals operated on, however, while not actually deprived of intelligence, had apparently lost the faculty of attentive and intelligent observations. When considering the hemispheres psychologically, Ferrier argues also that the power of fixing the attention and concentrating consciousness depends on inhibition. He shows that if the centres of inhibition, and thereby the faculty of attention, are weak, or present impulses unusually strong, volition becomes impulsive rather than deliberate.

It will be observed that the case whose history I have just given presented more pronounced symptoms than those reported by the writers whom I have quoted. The phenomena of the case, however, are to a great extent in accord with those of the cases mentioned, and also with the results of physiological experimentation. Loss of will-power, interference with the faculty of attention, and general feebleness of mind and body, were symptoms presented by my case in common with those recorded by others. Mental impressions were hard to fix, and he could not pursue any train of thought. As we sometimes say, "it took an idea a long while to get into his head." He was emotional and passionate; he spoke and acted impulsively; his voice was loud and monotonous. Such manifestations as headache and choked disk, which may belong to tumor anywhere within the cranium, need not here be considered.

The real or apparent motor-paralytic phenomena exhibited by this case would seem at first sight to separate it from the cases of Charcot

and Pitres, and others. His bowels and bladder were opened involuntarily; his legs were usually motionless; both arms, and particularly the left, were weak. I believe, however, from a careful study of this patient's symptoms, that the more or less passive state of motor organs was probably not due to a rupture of the communication between the periphery and actual motor centres, or to a destruction of the latter, but rather to a restraining influence exerted upon these centres by impressions coming from another portion of the brain. In other words, the paralysis, so far as it existed, was inhibitory-motor, and the case points to the probable presence of inhibitory-motor centres in the first and second frontal convolutions.

It must be remembered, in studying this case, that the destruction of brain-substance caused by the tumor was only in one frontal lobe, and that here it was not complete, even as regards the first and second convolutions, the posterior portions which probably establish communication with the true motor centres of the cortex remaining uninjured. A constantly growing mass, inflamed and inelastic, situated among but not entirely destroying inhibitory-motor centres, was an ever-present irritant of the most positive character, from which mandatory impressions were sent by conducting channels still intact to centres of actual motor execution. Movements still retained may have been partly reflex, and partly due to certain inhibitory-motor areas remaining unharmed.

So far as I know, satisfactory experiments have not been performed, and we have no pathological data of value bearing upon the question of the functions of the gyrus fornicatus or convolution of the corpus callosum, an anterior segment of which was destroyed by the tumor. According to Ferrier (p. 145), stimulation of the gyrus fornicatus by slipping insulated electrodes deeply into the longitudinal fissure failed to produce any outward manifestation. Ferrier's experiments on the corpus callosum, which was also invaded by the growth, were likewise negative. The corpus callosum is usually regarded as a system of commissural fibres, connecting corresponding regions of the two hemispheres. The apparent partial involvement of both sides of the brain, as indicated by some of the symptoms during life, may have been, to some extent, due to the lesion of the corpus callosum.

As already stated, in the experiments of Ferrier electrical irritation of the antero-frontal lobes usually caused no manifestations, but, in an isolated instance, movements of the eyeballs, sometimes laterally and sometimes upwards, were produced. I refer to this exceptional effect in connection with the case, from the fact that the patient was troubled with nystagmus.

The fact that the *left* eye became so violently inflamed during the last month of the patient's life claims attention, but I have at present no views to advance in regard to the matter. The tumor, it will be recalled, was in the *right* frontal lobe.

The heavy fall upon the head which the patient received may have had something to do with the origination of the growth, but as to this we can only conjecture.

Fibromata of the brain are rare forms of tumor, and we know but little as to their cause.

In regard to the localization of this tumor before death, the fact that the cranial nerves were not involved would go far towards excluding the base of the brain. Lesions of the corpus quadrigeminum or cerebellum would perhaps, on the whole, cause symptoms most closely allied to those presented.

In regard to the former, a tumor would not be likely to be limited to this body, and involvements of neighboring parts would have given more distinctive sensory and motor symptoms. Hemiopia, and those peculiar disorders of movement which have led some physiologists to locate the muscular sense in the corpus quadrigeminum, were, so far as I could ascertain, never observed.

Cerebellar ataxia, or titubation, which, according to Nothnagel (*Berliner Klinische Wochenschrift*, April 15th, 1878), is the only characteristic symptom of disease of the cerebellum, was not present. It was thought by his friends that he exhibited some tendency to fall backwards just before he was compelled to go to bed entirely; but even this could not be clearly made out; and, as Nothnagel has shown, it is a symptom oftener absent than not. Headache, disturbances of the eyes, choked disk, imperfect paralysis, and the early nausea and vomiting might have been present in tumor of the cerebellum or of various other regions. In excluding cerebellar disease I would incline to lay most stress upon the absence of cerebellar ataxia and the peculiarities of the psychical manifestations. Mental disturbance may be caused by a tumor in the cerebellum, but does not present any distinctive features, while, on the other hand, tumors of the antero-frontal lobes will, I think, be found—if the cases be studied carefully—to give intellectual symptoms of a tolerably constant character. The importance of an exact and systematic study of psychical phenomena in localizing cerebral lesions is greater than we usually suppose.

Observations were made both in general and in local or cerebral thermometry.

The following were the morning and evening temperatures, taken in the axilla, during the four weeks preceding his death:

September	18th,	morning,	98.6°;	evening,	99.9°.
"	19th,	"	97.8°;	"	100°.
"	20th,	"	97.8°;	"	98.3°.
"	21st,	"	98°;	"	99.8°.
"	22d,	"	98°;	"	97.5°.
"	23d,	"	97°;	"	99.1°.
"	24th,	"	98°;	"	98.9°.
"	25th,	"	99°;	"	100.8°.
"	26th,	"	98.5°;	"	99.1°.
"	27th,	"	97.4°;	"	99.6°.
"	28th,	"	98.3°;	"	99.9°.
"	29th,	"	97°;	"	99.4°.
"	30th,	"	98.7°;	"	99.4°.
October	1st,	"	97.8°;	"	99.5°.
"	2d,	"	98°;	"	99°.
"	3d,	"	98.4°;	"	100°.
"	4th,	"	97.6°;	"	99.4°.
"	5th,	"	98°;	"	99°.
"	6th,	"	99.7°;	"	101°.
"	7th,	"	99.2°;	"	98.1°.
"	8th,	"	98.8°;	"	101°.
"	9th,	"	99.3°;	"	100.9°.
"	10th,	"	101°;	"	101.8°.
"	11th,	"	99.7°;	"	101°.
"	12th,	"	99.4°;	"	99.6°.
"	13th,	"	99.3°;	"	101°.
"	14th,	"	99°;	"	100°.
"	15th,	"	100.3°;	"	100.4°.

I shall give these observations on general temperature without lengthy comments. I have no special knowledge of thermometric investigations in cases of tumor. It will be noticed that on fifteen days the morning temperature was below the standard of health, and also that almost always the evening temperatures were higher than those of the morning.

Physiological experiments performed by Eulenberg and Landois (*Centralbl. f. Med.*, 1876, p. 260), and by Hitzig (*Centralbl. f. Med.*, 1876, p. 323), indicate the presence in the cerebral cortex of heat-controlling centres. These centres, however, were found, not in the antero-frontal districts, but near the crucial sulcus of the dog, which corresponds to Rolando's fissure in monkeys and man. They were located pretty definitely in the well-known motor regions in the ascending convolutions. In general terms, destruction of the thermic area caused elevation and

irritation produced lowering of temperature in the opposite extremities. When, in the experiments of Eulenberg and Landois, irritation with strong induced currents was continued for a long time, constant temperature-reduction could not be obtained, irregular oscillations ensued, and sometimes even a small temperature-increase would take place, lasting, according to circumstances, for a shorter or longer period. Whether the lowering and irregular oscillations of temperature in this case of tumor were produced by general cerebral disturbance, or by the effect of pressure upon the not remote heat-centres, I merely present as a question for consideration.

Six stations on the head were selected, and local temperatures were carefully taken under my direction, on seven successive days, from September 23d to September 29th, by Dr. Thompson, one of the resident physicians at the Philadelphia Hospital. The instrument used was Seguin's surface thermometer. The observations were made between the hours of three and five in the afternoon. The points or stations at which the temperatures were taken were as follows: 1, a middle frontal station, in the centre of the forehead; 2, a middle occipital station, in the centre of the occipital region; 3, a right frontal station, near the external angular process of the frontal bone; 4, a left frontal station, similarly located on the left side; 5, a right parietal station, above the right ear; 6, a left parietal station, above the left ear.

The results of the observations are given in the following table, in Fahrenheit degrees:

	Middle frontal station.	Middle occipital station.	Right frontal station.	Left frontal station.	Right parietal station.	Left parietal station.
September 23d	95°	94.1°	95°	93.2°	94.1°	93.2°
" 24th	95	94.1	93.2	94.1	91.4	93.2
" 25th	98.6	95.9	96.8	95.9	96.8	95.9
" 26th	96.8	95.9	95	95	95	95.9
" 27th	96.8	95.9	95	94.1	95	94
" 28th	96.8	96.8	95	95.9	96	95
" 29th	96.9	96	95	95	95	94
Average temperature	96.5	95.5	95	94.7	94.7	94.4

The temperature of the room during these observations was kept at about 70°. The axillary temperatures ranged between 98.9° and 100.8°, averaging about 99.5°. Examination of this table shows several points of considerable interest, before referring to which, and in order that they

may be more clearly understood, I will allude briefly to the general subject of cerebral thermometry.

In 1877, M. Broca laid before the French Medical Association at Havre the results of some investigations on the temperature of the surface of the head in health and in disease, an abstract of which was published in the *Lancet* for October 20th, 1877. Observations were made on twelve individuals, and temperatures were taken on different regions, —frontal, temporal, occipital, etc. Some of his results in healthy individuals were as follows: maximum temperature of the head, 94.73° F.; minimum, 91.04°; giving a mean of 92.87°. The thermometers applied on the left side invariably registered higher than those of the right, when those examined were in the resting state. The frontal region gave an average temperature of 95.5°; the temporal, 92.69°; and the occipital, 91.25°. He also reports the results of some observations on cases of embolic hemiplegia.

At the meeting for 1878 of the American Neurological Association, Dr. Landon Carter Gray, of Brooklyn, read a paper on "Cerebral Thermometry," an abstract of which appears in the *Journal of Mental and Nervous Diseases* for July, 1878. His right and left frontal and parietal stations were the same as those selected in my observations. Occipital stations were taken on each side of the occiput, and four vertical stations around the fissure of Rolando. I will give some of Dr. Gray's conclusions. He found the average temperature of the left frontal station to be 94.36°; of the right, 93.71°; of the left parietal, 94.44°; of the right, 93.59°; of the left occipital, 92.66°; of the right, 91.94°. Alterations of more than 1½° he looked upon as suspicious of abnormal change at the point where the temperature was taken; more than 2° he considered strong evidence of such change. He mentions a case of glioma located during life by the thermometer, the autopsy confirming the determination.

Comparing the observations made on the case reported in this paper with the results obtained by Broca and Gray, we note several facts of peculiar interest. The temperatures generally were higher than those obtained by Broca and Gray on the heads of healthy subjects. The average temperature of the *right* side of the head, as determined at the right and left frontal and parietal stations, was slightly higher than that of the left, the latter in health being usually the higher. The highest average temperature was that obtained at the middle frontal station, which, from the location of the tumor in the anterior inner part of the right frontal lobe, would probably be, of the points taken, the one most closely

related to the intracranial growth. The mean temperature of the right frontal station, which was next in proximity to the tumor, was also slightly higher than the temperatures of the other lateral stations. The average of the middle frontal station was nearly four degrees higher than that of the whole head, which, according to Broca, is 92.8°, and according to Gray, 92.6°. On one day, September 25th, this region gave 98.6°. The middle occipital temperatures were also high, the mean of the seven observations coming next to the middle frontal. The fact of the patient constantly lying in one position on his back, and also that the occipital station corresponded nearly to the confluence of the sinuses in a congested brain, may have had something to do with this result. In the observations of Broca and Gray, the occipital temperatures, taken laterally, were lower than the frontal and parietal. On the whole, I believe that the observations on this case show that we can attribute a positive value to local thermometry in the regional diagnosis of intracranial tumors. The inference would seem to be that, in cases like the one here reported, the temperature of the surface near the seat of the growth is higher than that of other regions. The average temperature of the middle frontal station was 1½°, or more, higher than that of other stations, except the occipital, and it was even 1° above this. The temperature of the side of the head in which a tumor is located would also appear to be greater than that of the other side. In Broca's observations on embolic hemiplegia, he found the temperatures lower over the territories supplied by the occluded vessels, this being probably due to the anæmia here produced, and to the compensatory hyperæmia in the other regions. In cases of tumor we have hyperæmia and inflammation most marked in the side of the tumor. *November 14th*, 1878.

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2. *Tumor of the brain.*

Presented by Dr. J. T. Eskridge.

I am indebted to Dr. Henry W. Rihl for the clinical history of the following case:

"From Wm. S., æt. about 44, married, below medium height, with large head and broad shoulders, having a weight of about one hundred and eighty pounds, I obtained the following history. He had been for several years free from sickness of any kind, although he had several

severe falls on the head in the past year, and, on close questioning, admitted having had a recent chancre, which was followed by secondary symptoms a few weeks before I saw him, but positively denied ever having had a previous attack of syphilis. In the latter part of April, 1878, he was troubled with headache, for which he consulted several physicians; he, however, was not confined to his bed till a few days before my first visit, June 25th, 1878.

"He then complained of great headache (worse anteriorly, and most intense, when present, throughout his illness, in the right supraorbital region), obstinate vomiting, some giddiness, frequent attacks of hiccough, and inability to sleep well.

"The thermometer in the axilla throughout his sickness showed no increase of temperature. Under treatment, his headache subsided, to recur only occasionally, sleep returned, and nausea, vomiting, and hiccough ceased.

"Ten days after my first visit, Dr. Da Costa saw him in consultation with me. He then, or soon after, had less power on the left side than on the right, though the right seemed to be below normal; locomotion soon became difficult; he was unable to walk or sit without some support, was slow in his answers, and indisposed to talk. Dr. Da Costa, on the fifth day after he first saw him, detected choke-disk, and pronounced it a case of pressure of the brain, produced either by a tumor or by meningitis. Dr. Da Costa saw him till about the thirty-second day of his illness, when he had a mild dementia, being possessed with the idea that he was away from home.

"About the forty-first day of his sickness, after a two weeks' absence, I again saw him, and Dr. Updegrove, who had visited him in my absence, thought he had fever part of the time, though he did not use the thermometer. In some respects there was at this time marked improvement. Previously to my absence he had been troubled with involuntary evacuations. These had now ceased, and he could walk across the room with but little aid; his mind was now comparatively clear; there was no stupor; he began to be anxious about his condition, and to inquire concerning his business, which he had not done almost from my first visit in June.

"While these symptoms were more or less favorable, about this time others of a less favorable character arose. His headache, which had ceased for several weeks, again tormented him, sleep was poor, and his vision rapidly grew dimmer and dimmer, till about the sixty-fifth day of my attendance—fifty days after Dr. Da Costa had detected choke-disk,

and three weeks after he first complained of dimness of vision—he was completely blind.

"His urine, in the commencement of his attack, contained an abundance of phosphates, and early in September it was very copious, and so continued till near his death. He passed, according to his wife's statement, four chamberfuls per day. September 15th its specific gravity was 1003; it was then almost colorless. September 25th the specific gravity was 1005. On the last date, and again on October 7th, Dr. S. Weir Mitchell saw him with me. The improvement in locomotion which had occurred a few weeks previously only lasted a short time, and his mental condition, though less favorable, never became so bad as it had been at the beginning, till within a few days of his death, when he fell into a profound stupor, and his evacuations again became involuntary, but his appetite remained good throughout his disease, and was at times ravenous.

"During the last few weeks of his illness his head was inclined to the right side, and an attempt to carry it to the median line, or beyond this to the left side, gave rise to considerable pain.

"He died quietly, October 11th, 1878.

"*Autopsy*, thirty-four hours after death, was made by Dr. Updegrove and myself. The body was very fat, and contained considerable adipose tissue. The skull-cap, over the right supraorbital region, was nearly twice as thick as usual. *Brain and its coverings.*—The dura mater, over the anterior portion of the right parietal lobe, and over the posterior portion of the right anterior lobe, was greatly thickened and firmly adherent to the bony surface above it. On removing the dura mater, a small, yellowish, softened mass of brain-substance, about the size of a hickory-nut, was found in the upper portion of the ascending parietal convolution of the right side. The remaining convolutions of the upper and convex surface of the brain seemed healthy. The arteries and veins at the base of the brain appeared normal, as did also the whole of the left hemisphere, both at its base and in its substance. The base of the temporo-sphenoidal lobe and posterior base of the anterior lobe of the right side were decidedly softened. This portion of softened brain-substance was about the consistence of an ordinary poultice, and would ooze between the fingers on removing the pia mater. On cutting into the temporo-sphenoidal lobe of the right side from below, a large cavity or abscess, containing about an ounce of yellowish serous fluid, was found extending upward into the substance of, and scooping out the base of the ventricular portion of, the right corpus striatum, thalamus opticus, and

encroaching upon the anterior portion of the internal capsule. There were several other smaller cavities in the anterior portion of this lobe, all apparently communicating with the main cavity. To the outer side of and above this large cavity there was a tumor of considerable size buried in the white substance of the right parietal and frontal lobes, but not, so far as I could detect, involving the convolutions of the anterior lobe, but involving the ascending parietal. Another small abscess was found at the base and posterior part of the right anterior lobe. A small cystic tumor was found on the choroid plexus of the posterior cornu of the left lateral ventricle, and a larger and a smaller one were found on the choroid plexus in the posterior cornu of the right lateral ventricle. The largest of these cystic tumors was nearly the size of a small hickory-nut, the smallest, that of a pea. Remaining portions of the cerebrum, the cerebellum, pons, and medulla appeared healthy to the unaided eye.

" *Chest and abdomen.*—Both lungs congested; heart healthy; kidneys smaller than usual, and the left contained a calculus. Spleen-substance, with exception of containing a small whitish body, appeared healthy; liver healthy."

Microscopic examination of the tumor, by Dr. L. B. Hall.—" The tumor consists of spindle-shaped cells with nucleus and nucleolus. Some of the cells are elongated, forming bands or trabeculæ surrounding the shorter or more nearly round cells. From the structure of the sections I have made, it is a sarcoma, and not a glioma."

Dr. Rihl, in a note to me, states, " Though some of his friends thought they had noticed a change in his temper—being morose and irritable—for nearly a year prior to his illness, yet I was unable to detect it, although I saw him quite frequently." He also states, " The rapidity of its course and the polyuria were marked features of the case, the latter being, so far as I can discover, not a usual symptom of brain tumor. Dr. Da Costa suggested that this 'might be due to the disease encroaching upon the floor of the fourth ventricle.' "

In answer to my questions, Dr. Rihl said there were no convulsions, no disturbance of sensation, so far as he could determine, no paralysis of any of the cranial nerves, no ocular symptoms other than blindness and a staring and fixed appearance of the eyeballs, no psychical phenomena but those mentioned in the history, and the pain was not severer at night than during the day, but there was intense thirst almost throughout his entire illness.

So far as I can learn, no attempt was made during life to locate this tumor, and its chief interest seems to be in the destruction of so large an

amount of brain-substance in a region of the brain of which we know so little. The paralysis in the left arm and leg was never complete, but was much more marked in the leg than in the arm. This difference in the leg and arm may be accounted for by the softened mass of brain-substance which involved or encroached upon the *leg centre* in the anterior portion of the parietal lobe. *November* 14*th*, 1878.

Report of the Committee on Morbid Growths:

"The specimen of brain-tumor presented by Dr. Eskridge, and referred to the Committee on Morbid Growths for examination, was not in a very satisfactory state of preservation for histological study: however, it was determined to consist in part of degenerated brain-substance, and in part of a new formation composed of large spindle-shaped cells containing large nuclei, with a scarcely evident intercellular substance. The neoplasm presents the character of a large-cell spindle-cell sarcoma."

December 12*th*, 1878.

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3. *Hemorrhage into the right optic thalamus and small cyst in the right corpus striatum; also, in the same case, a large cyst in the left corpus striatum.*

Presented by Dr. Charles K. Mills.

H. P., æt. 55, female, five years before coming under observation, September 7th, 1878, had an attack of rheumatism, but since had enjoyed good health, except frequent morning headaches, until August 27th, 1878. On this day she felt weary and uneasy, and lay down to rest and compose herself. In about an hour, on attempting to rise, she found that her left arm and leg were stiff and helpless. She fell down; but I could not ascertain certainly whether or not she had been unconscious. She was put to bed, but in a few hours rallied, and was able to go around the house. She kept on her feet the most of the time between August 27th and September 7th, but had pain and uncomfortable sensations in the head, and she would often stagger and occasionally fall.

On examination, her mind was found to be dull and inactive. The mouth was drawn very slightly to the right, but her face was not otherwise paralyzed. Her tongue was protruded without difficulty and without deflection; and the uvula and soft palate were not paralyzed. She had marked paralysis of the left upper extremity. She carried the

fingers a little flexed, but they could be readily straightened. She had no grasping power in the left hand. The left lower extremity was also paralyzed, but was not as helpless as the corresponding arm. The limbs were not wasted. Farado-contractility was retained. She had control of her bowels, but her urine had frequently passed involuntarily since August 27th.

Diminution of sensibility was present in the leg, arm, and face of the paralyzed side. The anæsthesia was more decided in the face than in the arm and leg. Even the left side of the tongue showed loss of sensation.

She exhibited no hemiplegic symptoms and no anæsthesia of the right half of the body. Both the patient and her friends were sure that she had not had a stroke of palsy previous to August 27th, 1878.

Her condition remained about the same until September 15th, when she had all the indications of a fresh apoplectic attack. She became somnolent and semi-conscious, and had more or less muttering delirium. She had some dysphagia and difficulty of breathing. Her pulse was at first slow, but became rapid. All control of her bowels and bladder was lost. General muscular relaxation was present; but, by the resistance offered to passive movements, the helplessness, or motor paralysis, was found to be more marked on the left side. Anæsthesia of the left side seemed to be complete; but, owing to the overwhelming of the patient's faculties, the comparative sensibility of the two sides could not be thoroughly tested. On September 20th an acute bed-sore began to form on the right buttock, afterwards going through the usual stages of an eschar from cerebral lesion. Conjugate deviation of the eyes and neck was a symptom observed in this case; the turning of the eyes was towards the right or non-paralyzed side.

The patient was kept as completely at rest as possible, a purgative was carefully administered, liquid nourishment was given, derivatives were used; but the efforts to save her life were without avail, as she died on the 2d of October. Her temperature on the two days preceding her death was as follows: September 30th, in the morning, 99°; evening, 101½°. October 1, morning, 102.8°; evening, 103°.

A *post-mortem* examination was made seventeen hours after death. The skull was thin. The Pacchionian bodies projected very prominently. A large amount of serous fluid escaped on removing the brain. The pia mater, especially of the right hemisphere, was œdematous. The vessels of the circle of Willis and its branches were atheromatous; bluish-white plates were seen on their inner coats. The right middle cerebral artery

in particular showed decided enlargement and degeneration of its walls. In the temporo-sphenoidal lobe, just below the horizontal branch of the right fissure of Sylvius, was a number of dilated vessels. The lateral ventricles contained a small amount of fluid.

A large recent hemorrhage occupied almost entirely the interior of the right optic thalamus, and had extended into the right crus cerebri. It had not, however, communicated with the lateral ventricle or striate body. The right corpus striatum, about the junction of its intra- and extra-ventricular divisions, contained a small, irregularly shaped old cyst about a quarter of an inch at its greatest length. The left corpus striatum had, centrally situated, a large cyst fully an inch in diameter, from which a considerable quantity of a light straw-colored fluid was discharged. Both cysts had smooth, yellowish walls. No other abnormal appearances were discovered in the brain.

The anterior part of the upper lobe of the left lung showed a slightly emphysematous condition. Evidences of pericarditis and of acute endo-arteritis of the aorta were present. The spleen was atrophied; it weighed $1\frac{3}{4}$ ounces. Both kidneys were contracted.

In this case a point of considerable interest was the presence of the large cyst in the left corpus striatum, without the production during life of paralytic symptoms on the opposite side of the body. As from the history of the case the left hemiplegia and hemianæsthesia were probably due to the hemorrhage into the right optic thalamus, the small cyst in the left corpus striatum had also apparently not caused hemiplegic symptoms. It is now held by some neurologists that lesions of the thalamus opticus and corpus striatum do not of themselves produce paralysis; that the symptoms which so often result are the effects of pressure exerted upon the internal capsule. The tissue destroyed by the cysts in the corpora striata was well removed from the surface of the ganglia; if they represented former hemorrhages, the clots were so situated and of such size as possibly not to have caused marked pressure-phenomena. The hemorrhage into the thalamus opticus was of such a character as to probably involve the internal capsule to a limited extent directly as well as by pressure.

In regard to the occurrence of lesions in both corpora striata, I might say that I have several times seen cysts or softening in one of the basal ganglia apparently formed subsequently to a lesion of the corresponding body upon the other side of the brain.

In connection with the case just given, I also present, without special remarks, a specimen of *hemorrhagic cyst in the corpus striatum* taken

from another patient, simply stating that the case was under observation several months, and never presented hemiplegic symptoms.

December 26th, 1878.

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4. *Cerebral hemorrhage, with hemiplegia and hemianæsthesia.*

By Dr. Edward T. Bruen.

Margaret M., æt. 42, was admitted to the Philadelphia Hospital, November 11th, 1878. She was unconscious, with stertorous breathing; her feet and face were noted to be œdematous.

Her husband, who accompanied her, said that several months previously she had been treated, in the Pennsylvania Hospital, for Bright's disease. He also stated that she had always been an intemperate woman, and on the day before admission he had found her, on the floor of her bedroom, intoxicated, but, after waiting a sufficient time for the effects of the liquor to pass away, he found that she was unable to speak or to move the right side, and that the stupor was accompanied by twitching of the extremities on the right side of the body.

She was first seen by me in the condition noted above; the pulse was 90, of good volume. The cardiac dulness was much increased, the heart evidently being hypertrophied; temperature, $98\frac{3}{5}°$. Urine was found to contain a large amount of albumen, with numerous hyaline and granular tube-casts and some fatty casts, the hyaline variety predominating; urine scanty in amount.

On the 16th she became conscious, and during the day her power of speech returned to a certain extent, for she was able to make her wants known. Temperature on the right side, $99\frac{1}{5}°$. It was noticed, however, that she did not give any evidence of sensation on the right side of the body, including the head and face.

The conjunctivate could be brushed with a piece of worsted without annoyance, if the worsted was introduced between the lids from the side of the patient, showing that she was not blind, because she closed the eyelids if one attempted to introduce the worsted in front of the cornea.

Dr. Shakespeare, ophthalmologist to the hospital, reported the retina as in normal condition. The facial paralysis was of the variety usually seen in hemiplegia; the eyelids could be opened and closed, and the brow wrinkled.

During the next two weeks the paralysis improved very materially in the leg, somewhat in the arm, and the power of speech was partially regained. Her intellect never became sufficiently clear to enable me to

determine many points suggested by the case. Death occurred December 4th, 1878.

Autopsy.—The lungs were normal; the heart hypertrophied; no pleural or pericardial effusion; no ascites; liver fatty; the kidneys weighed about two and a half ounces each, and were fatty and contracted. The examination of the brain disclosed a large clot, the size of an olive, situated at the junction of the anterior portion of the left optic thalamus and the posterior portion of the corpus striatum. The brain-substance was destroyed at this point, but the main portion of the anterior part of the corpus striatum was not injured. The left ventricle contained a considerable amount of fluid blood and serum; the membranes of the brain were normal.

I would call the attention of the Society to the very great preponderance of symptoms of anæsthesia over those of hemiplegia, the former remaining always unchanged, though the paralysis became much less complete. The hemianæsthesia existed on the same side as the paralysis.

It has been said by some authorities that in cases of hemianæsthesia with paralysis the vision is affected in regard to the power to differentiate colors, as in some hysterical persons the same phenomenon is observed.

The case might also suggest the application of metallic bands to the limbs, for it has been said that similar cases have been relieved by this means.

It was impossible to work up these points in this instance, and I am aware that it is rash to cite this case as illustrative of cerebral physiology, because death ensued before the disturbances of the circulation had fully subsided; at the same time, the case is of collateral importance, and may be of interest to those engaged in the study of clinical medicine, for, owing to the labors of Meyer and Ferrier, I was able to localize the lesion before the death of my patient. *December 26th*, 1878.

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5. *Tumor of the brain.*

Presented by Dr. Charles K. Mills.

M. T., æt. 35, white, female, in 1875 had secondary syphilis. During 1876 she began to have spells of giddiness and staggering, and frequently recurring general headache. January 7th, 1877, she went to bed with a terrible headache, and three days later became paralyzed on the left side. She was confined to her bed for a month. Her bowels and bladder were

paralyzed for three weeks. Double vision came on with the paralytic attack, and remained for several months. During the year from January, 1877, to January, 1878, when she came under my care, she had continued in about one state, as regards her general health. Her headache had ceased, and her hemiplegia had improved slightly, apparently under the use of iodide of potassium, which she had taken steadily.

Her condition was noted in January, 1878. She had left facial paralysis. She could not corrugate the left side of the forehead, nor close the left eye. She had left internal strabismus. The lower part of her face was drawn to the right, and her tongue, on protrusion, deflected in the same direction. Her enunciation was a little imperfect, but she was not aphasic. The uvula and soft palate turned slightly to the right. The left arm was paralyzed, and was carried semi-flexed at the elbow. She could barely manage to elevate the entire limb to a horizontal line. With the left hand she could mark on the dynamometer 5°, with the right 35°. The left lower extremity was also paralyzed. When she walked, the left foot, which was kept turned outwards, was lifted from the floor with an effort of the entire limb, and came down again heavily. Farado-contractility was retained, but diminished, in the face, arm, and leg of the left side. Sensibility was diminished in the leg, but not in the face or arm. Hearing was impaired on the left side. Taste was preserved. Smell was defective, but the comparative condition of the sense on each side of the median line was not determined. She was easily excited and irritated. She had full control of her bowels and bladder. The right half of the body gave no evidences of true paralysis, but she seemed a little deficient in strength in the right arm and leg.

From January to August, 1878, but little positive change took place in the patient's condition. She went about the ward, and sometimes out of it, for a short time. She tired very easily, and often went to bed for an hour or two during the day. On the whole, her paralytic symptoms improved slightly, so that she seemed to gain a little more power in the ocular muscles and in the arm and leg. The improvement, however, was not decided, not as marked as is seen in many old cases of hemiplegia under treatment. Iodide of potassium, in doses of ten or fifteen grains three times daily, was given almost continuously. No iodism was produced by the drug; and she said that she always felt better while taking it. She seldom complained of headache; but once in several weeks she would have an attack, which would last for a few hours. She thought that her head got worse when she did not take the iodide. Occasionally bromide of potassium and mild tonics were administered. Her bowels

were carefully regulated by means of laxatives and purgatives. As her paralysis, during the period to which I am alluding, was not accompanied by irritative symptoms of any moment, electricity, both in the form of faradism and galvanism, was cautiously applied at intervals to the palsied muscles.

On the 26th of August she began to suffer with headache. Later, on the same day, vomiting set in, occurring at frequent intervals. Her bowels were constipated. A cathartic and bromide of potassium were ordered, and mustard derivatives were used to her feet, calves, and nape of the neck. Her headache increased, becoming agonizing, and she vomited frequently for two days and nights. On August 29th she became semi-conscious, and lost control of her bowels and bladder.

She began to perspire all over, but the sweating was much more marked on the right side than on the left. This tendency to unilateral sweating was first observed by the nurse August 30th; and it was also noticed on the afternoons of August 31st and September 1st, and on several subsequent occasions.

On the 30th of August her left eye began to inflame. Dr. E. O. Shakespeare, ophthalmologist to the Philadelphia Hospital, who took charge of the patient's eyes, has furnished me with the following notes made early in September:

"The left eye showed paralysis of the orbicularis palpebrarum and external rectus, and great congestion of the bulbar and palpebral conjunctiva, with a muco-flocculent discharge. The conjunctiva and cornea were insensitive, and there was necrosis of the lower portion of the latter. The iris and deeper parts were not sensibly involved. The right eye presented a normal appearance on external examination; its movements were unimpaired. Vision, as roughly tested, was good in this eye, but was not accurately measured. She had perception of light in the left eye. The ophthalmoscope showed the media of the right eye clear, the outline of the optic disk moderately distinct, the central arteries a little contracted and bordered by a narrow, frosty streak, the veins about normal, the level of the disk about as usual, the papilla of a dirty reddish-yellow, more intense near the borders, and opaque. The retina and macula lutea were not much changed. The fundus of the left eye could not be seen."

When she passed into the semi-conscious or apoplectic state, on the 29th of August, the motor paralysis of the left side became more pronounced, the face, arm, and leg becoming completely helpless, and the loss of power in the ocular muscles more marked.

On September 6th she began to have some difficulty in swallowing, which lasted for a few days. Fluids would be partly regurgitated. The same day, on attempting to feed her, she had a slight convulsive twitching or spasm of the muscles of the mouth, and of the hands and arms, and on two or three occasions subsequently, similar spells were observed. She never, however, had a well-marked convulsion, either unilateral or general.

For four weeks she remained in a low, helpless condition, sometimes rallying a little. Some paralysis seemed during this time to take place on the right side of the face and body.

On September 27th she showed decided signs of amendment, her pulse, temperature, inflamed eye, and general condition improving. She now complained greatly of pain in the left arm and leg, particularly on moving or handling them. The left knee-joint was especially painful. Both the left arm and leg were hyperæsthetic. She cried and worried. She talked very indistinctly, but by attentively listening much that she said could be understood. She regained control of her bowels. She continued somewhat better for four weeks, but varying considerably in her mental and physical condition from day to day.

On the 30th of October she became much worse, losing power on both sides of the body, and having involuntary passages. Her articulation became so low and indistinct that she could not be understood. She moaned almost continuously, and indicated that she had severe pain in her left arm and leg. She had some muttering delirium. She retained sufficient sight in her right eye to recognize faces and follow the movements of those around her up to a few days before her death, which occurred, from exhaustion, November 18th, 1878. Symptoms were treated, and every effort was made to sustain her strength and prolong her life.

A *post-mortem* examination was made twelve hours after death. No cicatrices, extravasations, or unusual appearances were observed in the soft parts covering the skull. The left eye was found to be turned inwards, slightly more than the right; and the lower two-thirds of the left cornea showed opacity and ulceration. A scar about three inches long, and one to one and a half inches wide, was present on the inner side of the left tibia. The skull-cap and dura mater were normal. The pia mater presented nothing abnormal, except a small area of injection and cloudiness about the middle of the parietal lobe. The cerebral substance on the upper surface of the brain was of average consistence.

The brain was removed from the cranial cavity with care, and was immediately turned over, so that the base could be first examined.

The dura mater and floor of the skull showed no evidences of disease or injury, the various fossæ, grooves, fissures, foramina, sinuses, ganglia, nerves, etc., having been examined as far as possible.

The base of the brain was remarkably distorted. Parts which are usually arranged symmetrically on each side of the median line seemed to have been pushed or dragged to the right. The right olfactory bulb was twisted out of position, so as to point obliquely at a considerable angle from left to right. The optic commissure and cut nerve-ends were swollen, and, with the corpora albicantia, were to the right of the middle line. How much of the distortion had occurred during or after removal of the brain from the skull could not, of course, be determined.

Just in front of the optic chiasm, the ends of two hard, pinkish-white nodules were seen, constituting what might be termed a twin-tumor. These masses were cuboidal in shape, and of about the same size, the sides of each measuring about two-thirds of an inch. They lay side by side, being distinct bodies, but were lightly bound together at their upper edges by thin fibrous bands. They were imbedded in, but readily separable from, the surrounding brain-substance, and did not appear to be connected with either of the membranes. They extended across the median line. On cutting into them they were found to be firm and uniform in consistence, but not difficult to incise.

The size and relations of the regions of the base of the brain in the location and neighborhood of the neoplasms were much altered, but they were so situated as to have apparently more or less involved in their growth the basal termination of the corpus callosum, the peduncles of the corpus callosum, the lamina cinerea, and anterior perforated spaces. They also probably encroached upon the roots of the olfactory nerves, the optic nerves and commissure, and the anterior portions of the circle of Willis.

The base from the posterior line of the tumor backwards to the pons was softened; optic nerve-ends, commissure and tracts, and the parts included in the interpeduncular space, actually melting away during the examination. The visible portions of both crura cerebri to within a few lines of the pons were softened, but not so diffluent as the interpeduncular bodies. The inner portion of the floor of the right Sylvian fissure, and the inner two-thirds of the island of Reil, were softened. The right temporo-sphenoidal lobe had the appearance of being lifted up or thrust away from the fissure. The circle of Willis seemed to have been broken by the obliteration of its anterior branches. The right middle cerebral artery appeared to have no connection with the vessels in front. On the

left, the posterior cerebral, posterior communicating, internal carotid, middle, and anterior cerebral, were joined, but much bent out of their usual courses.

The third and fourth nerves were in position, but distorted. The pons, medulla oblongata, and cerebellum were normal in consistence and appearance, but somewhat out of line, in correspondence with the dislocation of the entire base.

Examination of the convolutions, both of the base and of the superior and lateral surfaces of the brain, revealed nothing abnormal.

On cutting into the lateral ventricles, a condition of distortion, equally remarkable with that at the base, was observed. The right corpus striatum and right optic thalamus appeared to bulge considerably, being above the level of the corresponding bodies on the left side. The third ventricle, instead of being a narrow, oblong fissure in the middle line, was wide, shallow, nearly square in outline, and twisted on its axis towards the left. A little fluid was found in the posterior cornua. The choroid plexuses were normal in appearance. Just in front of the distorted third ventricle, the top of one of the tumor masses could be seen.

The right lung was bound to the chest-walls by strong pleuritic adhesions. Within the middle lobe of the right lung was a hemorrhagic infarction, which was very hard, of a dark-red color, and about as large as a small lemon. Two spots of consolidation were also found in the right middle lobe. No valvular or other lesions were discovered on examining the heart. Liver, stomach, spleen, and kidneys showed no gross appearances of interest.

The eyes, with the attached portions of the optic nerves, were removed, and have been examined by Dr. Shakespeare, who reports as follows:

"Thin sections of the anterior third of the left eye showed the ciliary body and iris normal. The corresponding sclera also was free from infiltration. The pericorneal conjunctiva was inflamed below and congested above the cornea. The cornea itself, commencing at the junction of the upper with the middle third, was softened throughout two-thirds of its depth. Over this area the anterior epithelium, and the middle and outer layers of the fibrous tissue of the cornea, were represented by a mass of embryonal cells, closely packed together. The posterior layers of the cornea were comparatively free from irritation. This condition of the cornea, commencing at the upper border of its middle area, extended down to the lower rim of this membrane. Over this extent its thickness was not much more than one-half that of its upper third, the loss

falling mainly on the anterior layers. Corresponding portions of the right eye were normal.

"Longitudinal sections from both optic nerves at their entrance into the globes were made and stained with carmine. The sections included a half-inch of the anterior ends of the optic nerves, the optic disks, and a small portion of the surrounding retina. Under the microscope it was found that the sclera and choroid were apparently normal. The subvaginal space surrounding the nerve was not unduly enlarged; neither was there much proliferation of the connective-tissue bundles which are usually found in this space. The fibrous bands of the lamina cribrosa were much more abundant than normal, and were increased in thickness. The anterior layers of these bands were curved forward, so that they were located far in advance of their normal position, and the connective-tissue cells upon them were more numerous and more swollen and granular than usual. The level of the surface of the optic papilla was not advanced; neither was the commencement of the granular layers of the retina much removed from the border of the scleral ring; nor were the nerve-fibres of the disk and retina swollen or degenerated. The capillaries here, however, were more numerous than usual, and their walls were slightly irritated. In the fusiform and irregular spaces between the nerve-fibres were small accumulations of embryonal cells. This cellular increase was more marked just within the border of the disk, and it extended backwards a little posterior to the level of the lamina cribrosa. The large arteries were seen to have their walls slightly thickened and their lumen a little contracted. The veins were not much changed and were not unusually distended.

"The condition of the optic nerve posterior to the lamina cribrosa was peculiar. Between the bundles of nerve-fibres was a very slight increase of cells in the lymph spaces, yet the bundles were not atrophied or unusually lessened in diameter, nor was the connective tissue between them increased in quantity. The vessels were not abnormally numerous or softened. Concerning the condition of the nerve-bundles themselves the following appearances were marked. At the posterior end of the sections, the presence of the so-called amyloid corpuscles in the thickness of the nerve-bundles was very frequent. Often several of these would form accumulations, which would substitute the nerve-texture for more than half the diameter of a bundle of nerve-fibres, and destroy the continuity of the bundle to that extent quite as effectually as would the cut of a knife. No other degeneration of the nerve-bundles could be made out. This alteration of the bundles gradually subsided in proportion as

the lamina cribrosa was approached, until near the latter it had entirely disappeared. The foregoing notes upon the condition of the optic nerves and papilla apply equally well to either eye."

Remarks.—This case simulated in many respects one of tumor, or other limited lesion, in the anterior part of the upper half of one lateral region of the pons varolii. The symptoms of circumscribed disease of this area, as given, for instance, by such authorities as Gubler, Brown-Séquard, Bastian, Nothnagel, and Seguin, are those of paralysis of both face and body upon the side opposite to the lesion. It is well known that in typical cerebral hemiplegia, that, for example, produced by affections of the main cerebral ganglia, facial paralysis is very incomplete; in particular, those branches of the facial nerve which supply the frontalis, corrugator supercilii, and orbicularis palpebrarum muscles escape. In hemiplegia from disease of the pons, however, the facial paralysis is usually well marked; and this is true whether the case be one of the so-called alternate hemiplegia from lesion of the anterior portion of the lower half of one lateral region, or one of unilateral paralysis of face and limbs of the same side from an affection of the upper half. Involvement of the orbicularis palpebrarum is considered an especially important feature of disease of the pons. Brown-Séquard, for instance, in one of the lectures so frequently delivered and published during the last few years, says that paralysis of the orbicularis palpebrarum, when central, occurs almost exclusively in cases of disease in the pons varolii. (New York *Medical Record* for January 19th, 1878.)

The internal strabismus from paralysis of the abducens or sixth nerve might also, perhaps, have been regarded as pointing to disease of the pons, as this form of palsy sometimes, although not commonly, accompanies the paralysis of the portio dura from central disease. The patient also suffered at an early period from slight, and later from very marked, difficulty in enunciation,—a symptom which Leyden has called *anarthria*, which is due to a paresis of the hypoglossal nerve, and is supposed to be characteristic of lesions of the pons and the medulla oblongata. Emotional weakness, anæsthesia of the leg, late implication of the trigeminal nerve, with apparent spreading of the paralysis to both sides of the body, might also, in connection with the other points referred to, have seemed to indicate a tumor of the pons.

While, however, the symptoms enumerated rendered the diagnosis of a localized lesion of the pons at first sight highly probable, a closer study of the case during life afforded some points which made me doubtful as to the region affected. Conjugate deviation of the eyes and neck in dis-

ease of the pons generally takes place towards the paralyzed side of the body; in lesions elsewhere, the deviation is usually towards the side of the injury in the brain. This symptom was absent altogether during the time the patient was under my care. In a disease of the pons of such long standing as the one under consideration, convulsions would be likely to occur sooner or later. The urine was examined and found to contain neither albumen nor sugar, which are said sometimes to be present when lesions of the pons, either directly or by pressure, cause irritation of the floor of the fourth ventricle.

It must be remembered also, in discussing this question of the probability of the symptoms present in this case leading to the diagnosis of a disease of the pons, that the symptoms supposed to be pathognomonic of a lesion of this part, have been proved by clinical and pathological observation not to be so absolutely. A few cases are on record, for instance, in which the upper fibres of the facial nerve have been paralyzed as the result of a lesion situated in the brain, above the pons and cerebral peduncles. Chvostek, quoted by Nothnagel (Ziemssen's Cyclopædia, vol. xii. p. 118), describes a case in which disturbances of speech and a feebleness of the extremities on the left side, present at first, disappeared almost entirely after a few days; on the other hand, the left facial nerve remained almost completely paralyzed (even the branch to the orbicularis palpebrarum), and the autopsy disclosed the presence of a hemorrhagic cyst in the right nucleus lenticularis. The following explanation of cases of this kind is given by Nothnagel (*op. cit.*, p. 147):

"When the tract of nerve-fibres passing along the base of the nucleus lenticularis, designated as the *ansa peduncularis* (Hirnschenkelschlinge, Gratiolet, Meynert), is involved in the lesion, the character of the symptoms is somewhat different from that described. The most noticeable difference seems to be that in this case the fibres of the facial nerve supplying the frontalis and the orbicularis palpebrarum, which otherwise escape, are paralyzed like the rest, as in an instance reported by Huguenin."

The inflammation, ulceration, and sloughing of the left cornea, with the accompanying insensibility of the conjunctiva and cornea of the same eye, are matters of great interest, both to the neurologist and ophthalmologist. The present makes the second case in which I have observed inflammatory, trophic, and anæsthetic phenomena in the eye, in connection with tumors located in the anterior regions of the brain.

The Casserian ganglion and its branches did not appear to have been directly pressed upon by the growths. These were, in fact, protected by being on a lower level, and by the peculiar conformation of the skull in

this region. The base of the tumor was apparently on the level of the anterior fossa and the surface of the body and lesser wing of the sphenoid bone, and was therefore separated by position and by bony processes from the nerves and ganglion in the cavernous sinus and Casserian depression. Both the carotid and cavernous plexuses of the sympathetic nerve, however, communicate with each other, and with branches of the fifth nerve. The cavernous plexus is also connected with the ophthalmic ganglion. Filaments from both plexuses are distributed to cerebral and ophthalmic vessels, and must have been directly affected by the neoplasm.

The extensive softening of the base of the brain present in this case is worthy of attention. The softened tissue had much the appearance of the milky-white softening which, after the lapse of a long time, sometimes takes the place of yellow softening. Much of the softening must, however, I am inclined to think, have occurred during the last few weeks, or even days, of the patient's life. Although the softening which occurs around adventitious products is commonly considered to be inflammatory, I do. not believe it to have been of this character, at least not entirely so in the present instance. Obliteration by pressure of the vessels which constitute or are given off from the anterior portion of the circle of Willis would better account for the process.

Extensive observations in general and cerebral thermometry were made in this case, but these will be reserved for another communication.

January 23d, 1879.

Report of the Committee on Morbid Growths:

"The specimen presented by Dr. Mills proves upon examination to be a syphilitic new formation (gumma), histologically consisting of embryonic cells, round and fusiform in shape, imbedded in a granular fundamental substance. These elements are very distinct at the periphery, while at the centre of the growth they are indistinct and constitute a granular débris. At the periphery, also, are seen numerous blood-vessels having well-defined walls; in the lumen of many are found the red corpuscles of the blood." *February 27th*, 1879.

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6. *Glioma of pons varolii.*

Presented by Dr. Wm. Pepper.

Dr. Pepper, who had seen the patient during life, presented the specimen, with the following history, based on the notes by Dr. T. V. Crandell:

M. A., æt. 5, a very healthy boy, became affected in July, 1878, with

internal squint of left eye, and nightly paroxysms of excessive silly laughter. Two weeks later, slight paralysis of the right arm was noticed, which gradually increased and became associated with rigidity. This was soon followed by weakness of the right leg, which increased until loss of power was nearly complete, and was attended with rigidity. During sleep, however, both arm and leg became relaxed. Difficulty in deglutition appeared early, and increased. There was paralysis of the left orbicularis palpebrarum and of left external rectus muscles; but the muscles of forehead and of face were not involved. The tongue was protruded straight, and could be moved from side to side, but not freely. The sensibility was not impaired at any point. Electro-muscular contractility was present in all the paralyzed muscles. Speech was lost, apparently from difficulty in articulation. Intelligence was perfectly preserved till near the close. Sight was good in both eyes. Sense of smell and taste was good, as he objected to the taste of medicines, and had decided preference for certain kinds of food. Difficulty in swallowing increased, so that fluids were regurgitated through the nostrils; nutrition was, however, well kept up. In November he suffered from intense headaches, and frequent attacks of palpitation of the heart, with flushing of face and injection of left conjunctiva, and with increased rigidity of right arm and leg. There was temporary improvement in the state of the muscles of left eye, apparently due to the use of faradism. Death occurred from paralysis of the pneumogastrics on 29th November.

The *post mortem* examination was limited to head. Calvaria and dura mater normal. The sinuses were healthy. There was some congestion of arachnoid. About f℥iv of clear serum escaped from the base of the brain. The ventricles of the brain were enlarged and distended with serum. All parts of the brain-tissues were healthy, excepting the pons, which had undergone gliomatous transformation. At first sight there appeared to be merely an irregular enlargement of the pons, as there was no distinct separable neoplasm. It measured 2.3 inches in transverse diameter and 1.5 antero-posteriorly. By its enlargement it had encroached somewhat on the cerebellum, which was compressed or hollowed out, particularly in the region of the left pneumogastric lobule. On section, the pons presented a smooth, glistening, homogeneous structure, resembling to a considerable degree the normal white substance of the hemispheres. It was less striated in appearance than the normal tissue of the pons, and had at the same time a more gelatinous or translucent appearance. Its consistency was quite firm on the right side; but on the left side there was hemorrhagic infiltration, with central cystic softening.

On microscopic examination, thin sections through the right half of the tumor, carmine-tinted, exhibited an infiltrate of small, round, and oval cells imbedded in a finely granular matrix. A few larger cells, epithelioid in appearance, $\frac{1}{1000}$ of an inch in one diameter and $\frac{1}{2000}$ in another, were also seen.

Sections from the centre of the tumor exhibited similar appearances. Sections through the left half of the tumor exhibited the same elements, obscured in places by numerous blood-corpuscles, which infiltrated this portion of the growth.

Remarks.—The existence of a tumor, probably of the pons, was clearly recognized before death. No cause could be suggested, unless repeated falls on the head might have induced it. There was no suspicion of inherited syphilis. The treatment throughout was by iodide of potassium and bichloride of mercury. A faradic current was applied to the paralyzed muscles, and a mild galvanic current was repeatedly used on the head. *January* 23*d*, 1879.

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7. *Epithelioma of nasal fossa invading sphenoid and ethmoid bones and membranes of brain.*

Presented by Dr. Wm. Pepper.

Mrs. W. had suffered for several years from post-nasal catarrh, when, in 1876, at the age of 73, she consulted me, and on examination I found enlargement of tonsils and granular pharyngitis. Six months later (April, 1877), she first noticed a sense of fulness in the right side of the throat, causing frequent efforts to remove the obstruction, which brought away some muco-sanguinolent discharge from post-nasal space. The voice was a good deal affected. These symptoms had lasted a month before I again saw her, when examination showed that there was a rounded bulging downwards of the posterior part of the soft palate. On palpation it was firm and elastic. The finger passed behind the soft palate distinguished a rather firm, smooth, rounded growth springing by sessile base from outer wall of right nasal cavity and attached to soft palate. Various applications were made to posterior surface of the growth by means of bent brushes, but without effect. I then resorted to interstitial injections of solutions of ergotin, administered by passing the needle of the hypodermic syringe through the soft palate into the polypoid mass. Five grains were given each time, and the injections were repeated every three days for two months. This treatment was

certainly followed by benefit. The sanguineous discharge ceased, the bulging of the soft palate diminished, and the sense of obstruction was lessened. She left the city in June, treatment was discontinued, and I did not see her till the end of September, when I found that during summer the nasal growth had increased, and that there had also been severe pain extending through the right side of the head. She had lost flesh and strength. There was marked increase in the deafness on right side, and she also complained of dimness of vision of right eye. The pain in head soon became incessant and violent, and the mental powers began to fail. The muscles of the right eye became partially palsied (see full account below), vision was apparently almost lost, and hearing entirely so on the right side. Dr. E. O. Shakespeare, who visited her in consultation on November 15th, has furnished the following note of the conditions of the eye:

"There was partial paralysis of the levator palpebræ superioris and of the orbicularis of the right eye, so that the upper lid could be only partly raised, and the lids could not be entirely closed. The lower margin of the cornea of this eye and the bulbar conjunctiva below were not covered during attempts at closure. There was complete paralysis of the external rectus of the right eye, and possibly a very slight paresis of the muscles supplied by the third nerve of this side. There was lessened sensibility of the integument of the right half of the face, as also of the conjunctiva and cornea of the right eye. The cornea was extremely hazy, particularly its lower half, where the anterior epithelium was opaque and slightly desquamating. The conjunctiva, both palpebral and bulbar, was in an acute catarrhal condition. The pupil was about normal, as was also the tension of the eyeball. Vision of this eye was so much reduced that she could with the greatest difficulty count fingers at one foot. In consequence of the haziness of the cornea it was impossible to obtain a distinct view of the fundus, and the condition of the nerve could not be definitely determined by the ophthalmoscope.

"The muscles of the lids and globe of the left eye were not perceptibly affected, nor was the sensibility of the skin, conjunctiva, or cornea appreciably blunted. The media were clear; the iris was normal in color and texture, and was somewhat sluggishly responsive to varying quantities of light. Acuity of vision in this eye was a little subnormal, and the visual field was sensibly narrowed concentrically. The ophthalmoscope showed the optic disk sharp-bordered and a little irregular in outline,—the irregularities being due to interrupted deposits of black pigment in the choroid ring and the edge of the disk. There was a deep and wide

central physiological excavation of the head of the nerve, showing very distinctly at the bottom the glistening lamina cribrosa through which the central retinal vessels were observed to pass. The calibre of the retinal arteries was considerably narrowed and their perivascular sheath was unusually thick and distinct, being represented by a yellowish-white, frosty streak on either side of the blood-stream, of a width frequently quite equal to that of the latter. These vessels were not abnormal in their course.

"The large retinal veins also showed some of the same frosty bordering, but by no means so extensively. They were moderately full of blood, and were a little more wavy than usual, especially at a distance from the disk.

"The color of the whole of the surface of the optic disk between the previously mentioned central excavation and the choroid ring presented a dirty red-gray tint, and did not offer its usual semi-translucence. The general level of the disk appeared to be a little below that of the surrounding retina.

"In the vicinity of the disk the retina appeared slightly striated, and scattered among the nerve-fibres were to be seen considerable numbers of minute, yellowish-white, opaque points and streaks.

"In the neighborhood of the macula these points became a little more numerous, but in this position their disposition was not at all radial. The same general character already mentioned for the blood-vessels of the nerve was to be seen, although less markedly, in the retinal vessels."

It was necessary to keep her continually under the influence of morphia, which was effectually done by means of hypodermic injections. She gradually sank into a state of mild dementia, in which she would partly arouse from the influence of morphia only to resume incoherent expressions of suffering. Death occurred December 15th, 1877.

Dr. Shakespeare has also presented the following report of the post-mortem and microscopic examinations.

Autopsy.—"The brain only was examined. The external appearance of the cranial vault was not at all abnormal, nor was the thickness or color of the calvaria. The dura mater was readily separated from the inner surface of the bone upon the vault and sides of the cranium. Its tension was not unusual, and upon the convexity it presented nothing abnormal. The longitudinal sinus was partly filled with fluid and recently-clotted blood. Along the longitudinal median fissure this membrane was

considerably adherent to the pia mater. The pial covering of the convexity of the cerebrum was possibly very slightly thickened. The Pacchionian bodies were somewhat prominent. The large vessels were moderately full of dark fluid blood, and presented no appearance of alteration. On removing the brain it was found that at the inner portion of the bottom of the right middle cerebral fossa, the membrane and the cerebral substance itself were firmly fastened to the base of the skull. Over the area of an inch at the apex or inner portion of this fossa, the greatly thickened dura was so firmly adherent to the bone that it could not be separated at this point. Here also the dura and pia mater were intimately united together and fastened to the corresponding cerebral substance, which was at this point indurated to the depth of a quarter-inch.

"This adhesion and thickening of the dura mater corresponded in location to the space on the floor of the fossa, between the foramina rotunda and ovali and the position of the right cavernous sinus, which latter was partly included within the thickened membrane. It reached anteriorly to the edge of the sphenoidal fissure, and posteriorly as far as the foramen lacerum medium.

"The dura was not unduly adherent to other portions of the base of the skull, nor were there abnormal adhesions between the dura and pia mater other than those already mentioned.

"Viewing the inferior aspect of the brain, it was observed that the large vessels were not visibly altered. The right optic tract was slightly narrower than its fellow of the opposite side, but there was no marked difference in the size of the intracranial portion of the two optic nerves.

"The pial covering of the base was slightly cloudy, but not at all roughened, nor, except in the immediate vicinity of the already-described adhesion, was there any indication of inflammatory exudation. Beyond the neighborhood of the before-mentioned adhesion, the pia mater of the base was not unduly congested.

"Upon slight pressure some clear colorless fluid welled up from the infundibulum.

"An examination of the cortex of the brain revealed nothing unusual other than the previously-mentioned point of induration. There was a drachm or two of colorless serous fluid in the lateral ventricles; otherwise there was no naked-eye evidence of disease in any part of the cerebrum, cerebellum, pons, or medulla.

"Inspection of the base of the skull from the cranial cavity showed the cribriform plate of the ethmoid bone greatly softened. The whole of the body of the sphenoid and the anterior part of the basilar process

of the occipital bone were in a similar condition. The softening had so far advanced that they were easily removed by a small scalpel, which could be plunged into them with as little resistance as would be offered by a piece of cheese.

"The cranial surface of these bones was nowhere the seat of fungous projections. There was not even abnormal alteration in level of the superficial part of these bones. The right ala majora of the sphenoid had undergone some softening near its junction with the body. So also had the apex of the petrous portion of the right temporal bone. The surface of section of the softened body of the sphenoid bone offered a grayish, opaque, granular aspect, and no juice exuded from it after moderate pressure.

"After breaking through the roof of the orbit, the posterior two-thirds of each eye, with its corresponding optic nerve, was removed and placed in a hardening agent. To the naked eye there did not appear to be an invasion of any of the tissues within either orbit.

"*Microscopic examination of the eyes.*—After hardening in picric acid a portion of the posterior of each eye, comprising the entrance of the optic nerve, some extent of the retina and ocular membranes and the optic nerve itself for a half-inch of its extent was properly prepared, and cut into thin sections, which were longitudinal to the axis of the nerve and vertical to the surface of the retina. Nearly all the sections thus obtained were examined, but the four central cuts from each eye were mounted and more particularly studied. The latter showed the central vessels in some part of their course both anterior and posterior to the lamina cribrosa.

"*Right eye.*—The optic papilla was slightly swollen, and the granular layers of the retina did not begin at the margin of the choroid ring, but at a considerable distance beyond it. The veins and capillaries of the papilla and adjoining retina were a little distended, and their walls were thicker than usual. The arteries of the retina possessed a small contracted lumen and much thickened walls. Of the two large arteries of the papilla, one, near the lamina cribrosa, was nearly occluded by the apex of a blood-clot which extended backwards in the central artery behind the lamina cribrosa. The connective tissue between the nerve-fibres and that ensheathing the vessels of the papilla and adjoining retina was somewhat increased and slightly infiltrated with embryonal cells. There were no extravasations of red blood-disks. The integrity of the nerve-fibres did not appear to be affected to any considerable extent. The lamina cribrosa was more dense than usual, and thicker from before

backwards. In the large central artery behind the lamina lay the continuation of the blood-clot, whose anterior apex partly occluded one of the large arteries of the papilla. This blood-clot was more or less fusiform, and extended nearly as far back as the entrance of the central artery within the nerve. Its diameter was about half that of the lumen of the vessel within which it lay, and its constitution indicated that it had been formed some time anterior to death, for many of the red corpuscles which it included had commenced to undergo granular degeneration. It was slightly adherent along one side of the arterial wall, where it had excited an irritation of the cells of the tunica intima. This irritation was apparent along the whole extent of the clot. The rest of the lumen of the artery and its large branches was partly filled with fibrinous clots, in which the red disks appeared to be unchanged. The capillary vessels in this part of the nerve presented walls slightly thickened. The bundles of nerve-fibres were not sensibly narrowed, and there appeared to be no degeneration within them. Neither was the connective tissue between them very much irritated or infiltrated. The pial sheath of the nerve was increased in thickness, and the subvaginal space, which was a little distended, contained a considerable increase of the fibrous bands usually found in it.

"*Left eye.*—The optic nerve and retina gave unmistakable evidence of an atrophy of the nerve-fibres consecutive to a marked sclerosis of the walls of the blood-vessels and their enveloping connective tissue.

"*Microscopic examination of the body of the sphenoid.*—Thin sections of this softened mass, to the naked eye, offered a reticular structure with narrow meshes. Under the microscope the tissue appeared to consist of a stroma of fibrous tissue, limiting meshes usually large but sometimes small. Oval, round, or oblong in outline, these meshes were more or less completely filled with masses of epithelial cells closely packed together without any visible intercellular substance. At the periphery of these cell-clumps the cells were cylindrical, and, by their bases, rested perpendicularly upon the surface of the limiting stroma. Advancing from the periphery towards the centre of these cell-masses, the form of the cell changed from the cylindrical to the round cell, and finally to the discoid or flat squamous cell of the corneous layers of the epithelium of some mucous membranes. Frequently each of these forms of cell was applied upon the other two or more layers deep. Many of the cells, particularly those nearer the centre of the clumps, were undergoing mucous or colloid degeneration.

" The fibrous stroma limiting the cell-clumps in different points showed

all the stages of transition from comparatively normal white fibrous tissue into embryonal tendinous tissue. The trabeculæ carried all the vessels, which were often embryonal, and which showed no tendency to project into the cell-clumps above mentioned.

"The morbid mass therefore very well represented the structure described by Cornil and Ranvier as a lobulated epithelioma with epidermic evolution." *January* 23*d*, 1879.

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8. *Tumor in the right lobe of cerebellum.*

Presented by Dr. L. S. Clark, for Dr. A. S. Gerhard.

Rosina M., German. æt. 20 years, single; never been pregnant; housework; no previous disease except those incident to infancy and childhood in the usual form; no mechanical injury; father died of smallpox eight years ago; mother living and healthy; two brothers—one older, the other younger—died of pulmonary tuberculosis within six weeks preceding her own death; no hereditary tendency to disease in the family as far as memory reaches back, all the ancestors living to a good old age; uncles, aunts, and cousins are healthy; grandparents, both paternal and maternal, still living; three brothers, all younger, still living and healthy; died, April 25th, of exhaustion due mainly to long-continued and intense pain in the head.

About the 1st of December, 1877, this "headache" first made its appearance, for which she was treated under the direction of Dr. H. W. Newcomet. On March 18th, 1878, she passed into my hands, when she presented the following symptoms: bed-fast, but able to help herself; decubitus right side; complexion fair; very pale; emaciation and bodily weakness *rather* considerable; skin moist, its temperature the same in both axillæ, varying from 100° to 102½°; slight and loose cough, with but little expectoration of light greenish and consistent sputa; thoracic pain none, except the last few days of life; and, indeed, no general pain; percussion showed marked dulness over apices of both lungs, and auscultation revealed moist râles over the apex of the left, and bronchial breathing over that of the right lung; menstruation suspended for two months; appetite generally good, and digestion regular and normal; no hectic nor colliquative sweating, *except during the paroxysms of headache;* sweats cold and clammy; no œdema; no diarrhœa; occasionally vomiting, but only upon a full stomach and at beginning of a paroxysm of headache; heart-sounds indicating no organic disease; pulse varying from 120 to

130 per minute; no impairment of intellect; no paralysis; no convulsions nor any want of muscular co-ordination whatever. During the last few days, however, her face (during the paroxysms only) would be drawn towards the *left* side, whether from muscular contraction on that side, or from relaxation of the facial muscles on the opposite side, I have not determined; and this was accompanied by a rigid drawing backward of the head, by pain in the left shoulder and arm, and by a marked determination of sensation (not of motion) in the same shoulder and arm. The pain in her head was simply excruciating, at first involving the whole cranium, afterwards only the forehead and temples, but finally only the back of the head and nape of the neck. The pain in its character, as long as the paroxysm lasted, was constant, acute, without intermission; she was in fact not able to describe the precise characteristics of the pain. The paroxysms of pain recurred at something like regular intervals: at first, *Friday* was her "bad day," being comparatively free from pain during the rest of the week. Then for a period of two weeks (from March 23d to April 6th) she was completely relieved, taking $\frac{1}{50}$ grain doses of phosphorus three times a day, along with strychnine, quinine, and bromide of iron. From the latter date on she had a paroxysm either daily or every other day, generally from 8 to 12 o'clock A.M., until the last two days, when there was no intermission, when she died of sheer exhaustion. None of the many medicines given were of any avail in stopping the pain in the head.

The *post-mortem*, made ten hours after death by Drs. Leonardo S. Clark, H. W. Newcomet, and myself, revealed tubercles in the apices of both lungs, those in left softening, with a well-marked vomica and extensive pleuritic adhesions, and the right indurated. A very small heart. An enlarged and slightly fatty liver. A biliary calculus the size of a common cherry in the gall-bladder. The cerebrum was slightly softened, its arachnoid much congested, with an *appearance* merely of purulent matter underneath, and about the normal amount of serum in its ventricles. The cerebellum was normal as to appearance, the two lobes alike as to size, but the *right* lobe containing the tumor herewith respectfully submitted for examination; but, contrary to my full expectation, no apparent trace of tubercle in any part of the brain, unless the accompanying tumor be tubercular. *January* 23*d*, 1879.

Report of the Committee on Morbid Growths:

"The tumor from the brain, presented by Dr. Clark and referred for examination, is found histologically to consist of numerous lymphoid cells

in various stages of granular degeneration. Between the cells is seen a very indistinct, reticular, connective tissue. A transverse section of the blood-vessels shows their walls to be infiltrated with lymphoid cells, and their lumen containing the débris of blood-elements and cells, completely obliterating the vessels. The new formation is a tuberculous growth."

February 13*th*, 1879.

VII.—ORGANS OF SPECIAL SENSE.

1. *Case of aspergillus glaucus in both auditory canals of a woman.*

Presented by Dr. Charles H. Burnett.

The specimen of fungus—the aspergillus glaucus or flavescens—which I present this evening was removed, February 20th, 1879, from the left ear of a lady 30 years old, both of whose ears were affected by the fungus.

It may be of interest to state that this patient was afflicted, three years ago, by the growth of aspergillus nigricans in both ears.

The patient stated that during a month and more, previous to her visit to me last month, both ears had itched and burned very much, that she had scratched the canals in spite of herself, and that at last a watery discharge had come from them. They began to feel stuffed up; the hearing became dulled; the auricles had become somewhat tumid and red, probably from manipulation; and there had been one or two small furuncles in the canal of the left ear. The annoyance had made the patient nervous and depressed, and there were some dyspeptic symptoms.

A physician in Asbury Park, where she resides, had prescribed cajeput oil and other oils, for her ears, but the more oleaginous matter she had put into her ears the worse they became.

Upon inspection with the aural mirror and speculum, both canals were seen to be plugged with a dark grayish mass. By means of the syringe a glove-finger cast of each canal was washed out, one of which I show you in this small vial. Its peculiar shape has been destroyed to a great degree, on account of tearing it to get microscopic specimens from its deepest parts. The fungus was found growing in both auditory canals, and the skin lining the latter was found greatly tumefied and inflamed, and at spots ulcerated. The history of the case showed that there had been a seborrhœic condition of the ears before the fungus began to grow in them.

The symptoms of the growth of this fungus in the ear have already been detailed by me, in a paper presented to you last spring. My chief

object in laying this specimen before you is the exhibition to the Society of this rare form of aspergillus. In twenty-two cases of aspergillus in the ear, this is the first instance of the aspergillus glaucus I have met, the other twenty-one cases being of the aspergillus nigricans.

In the woodcut I herewith show you, the latter fungus—the aspergillus nigricans (*b*)—is seen to be the larger, and its receptaculum is evenly surrounded by its sterigmata; whereas in the aspergillus glaucus (*a*), the variety exhibited this evening, the receptaculum is bare on its lower fifth and the entire head is smaller than the aspergillus nigricans.

It is also worthy of note that the receptaculum in this variety is pear-shaped, while in the aspergillus nigricans the receptaculum is spherical, being also marked at its point of juncture with the stem by a constriction. These diagnostic points are so sharp that no difficulty need be experienced in differentiating one form of the fungus from another.

Whether this form shown you to-night excites a severer and more obstinate inflammation in the ears than the aspergillus nigricans yet remains to be shown. Its occurrence is much less frequent than that of the aspergillus nigricans. *March 27th*, 1879.

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2. *Optic neuritis as a symptom of intracranial disease.*

By Dr. William F. Norris.

That certain forms of blindness and impaired vision are frequent accompaniments and results of cerebral disease is a fact which has been recognized in all ages in every country where there has been even a rudi-

mentary development of anatomy. We find this clearly stated by the Hindoos and Egyptians, and still more plainly by the Greeks and Romans.

Although very interesting, such observations lose much of their value to us of the present day, for the reason that the knowledge of anatomy and physiology possessed by the writers was so imperfect that it is impossible for us, from their description, always to separate the amblyopia produced by local changes of the retina or choroid, or by paralysis of the ciliary muscle or partial opacity of the media of the eye, from that produced by disease of the brain centres or optic nerves.

Türck,* of Vienna, however, in 1853, awakened renewed interest in the subject, by describing retinal hemorrhages, which he attributed to increased pressure in the venous sinuses of the dura mater; and, in 1860, Graefe† wrote a paper, in which he not only called attention to the frequency of inflammation of the optic nerve in cases of cerebral disease, but described two varieties of it,—one accompanied by intense swelling of the intraocular end of the nerve, which he designated as stasis papillæ, and the other as neuritis descendens. He based these distinctions on four cases of choked disk, in two of which autopsies had been made respectively by Virchow and by Schweigger. In both of these there was sarcoma of the right hemisphere, with inflammation of both optic nerves, and the changes were mainly limited to their intraocular ends. He relates, also, other cases where there was marked inflammation of the optic nerves, with less swelling of the intraocular ends, and in which, although there was no autopsy, the symptoms pointed to meningitis, and in these he supposed there was probably a descending neuritis.

Five years later we find him,‡ in another paper, still further elucidating this theme and detailing another case of brain-tumor, in which there was a choked disk on one side only, and also three cases of inflammation of the nerves, in which the autopsies showed that the interstitial neuritis extended throughout the nerve.

The types thus recognized and described by Von Graefe are now universally recognized, although, as he himself pointed out, it is not possible, in all stages of the affection, to distinguish between them with the ophthalmoscope. The choked disk shades off into the more ordinary form of neuro-retinitis; this again into the stage of atrophy so gradually that in describing a case it is often difficult accurately to classify the appearances presented by the intraocular end of the nerve.

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* Zeitschrift der Gesellschaft der Wiener Aerzte, 1853; *Ibid.*, 1852 and 1855.

† Archiv f. Ophthalmologie, vii. 2.

‡ Ibid., xii. 2.

Since that date both the journals devoted to ophthalmology, as well as those of general medicine, teem with cases more or less accurately reported. It is, however, not my intention to give an analysis of them, but, after calling your attention to the statistics showing the frequency of their occurrence, to demonstrate to you on the screen, by means of the gas lantern, the various stages of neuro-retinitis, and the anatomical changes found in the tissues involved. As regards the frequency with which optic neuritis occurs in cases of brain-tumor, there has been considerable difference of opinion. Thus, as late as 1868, at the Heidelberg Congress, Becker gave it as his opinion "that brain-tumors frequently occur without any swelling of the disks," and Schweigger, in his Handbook, in 1871, says "that choked disks are absent in the majority of cases of brain-tumor."

More recent statistics, however, prove the contrary. I will only cite here those of Annuske* and of Reich,† and will regard among these only those cases where there was an ophthalmoscopic examination during life; of such cases the former gives forty-three and the latter forty-five, making a total of eighty-eight cases. Of these, in eighty-two cases (*i.e.*, ninety-three per cent. of them) there was double optic neuritis. Basilar meningitis, especially the basilar meningitis of tuberculous children, is probably the next most frequent cause of optic neuritis. Thus, Heinzel‡ gives thirty-three cases of basilar meningitis in children, of which twenty-seven (eighty-one per cent.) showed either neuritis or consecutive atrophy. Allbutt§ gives thirty-eight cases of basilar meningitis, out of which twenty-nine (or seventy-six per cent.) showed changes in the optic disks.

We thus see that double optic neuritis becomes a valuable symptom of brain-tumor and basilar meningitis. Such cases, of course, usually end fatally from the natural progress of the malady causing them; but I have seen occasional cases of basilar meningitis in children, where they had escaped with partial or complete atrophy of the optic nerve, and, in adults, cases of syphilitic gumma within the cranium, and of cerebro-spinal meningitis, where there was marked optic neuritis, and recovery with partial atrophy of the disks. I believe that the number of such cases in which double optic neuritis occurs is usually much under-estimated, simply because it is not carefully looked for, many thinking it not worth while to examine the eye-ground unless there is marked failure of vision.

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* Archiv f. Ophthalmologie, xix. 3.

† Klinische Monatsblätter f. Augenheilkunde, vol. xii.

‡ Jahrbuch der Kinderheilkunde, vol. viii.

§ Use of the Ophthalmoscope, 1871.

I have followed a case for months where there was marked choking of the disks, and in which vision remained good ($\frac{20}{xxx}$); and Mauthner* cites a case where the patient, to the day of his death, retained perfect central vision ($\frac{20}{xx}$). The ophthalmoscope should therefore be used in every case of suspected brain-tumor, whether there be failure of sight or not. [The lecturer here showed on the screen four cases of various grades of neuro-retinitis,—one a choked disk intensely swollen full of small tortuous blood-vessels, with a few small hemorrhages in its superficial layers; one showing the same affection in a less degree; and two of descending neuritis, from cases of meningitis.]

To explain the connection between the intracranial affection and that of the distal end of the optic nerves, physicians have had recourse to various theories. Three of these deserve our careful attention,—viz., I. the back-water theory; II. the vaso-motor theory; III. the lymph-space theory.

Von Graefe, who supported the first, supposed that increased intracranial pressure caused a back-water movement of the blood in the venous sinuses of the dura mater, which was transmitted thence by the ophthalmic to the central retinal veins, the lamina cribrosa acting as a multiplier, and increasing, by its constriction of the vessels, the œdema and congestion of the intraocular end of the nerve. The anatomical investigations of Sesemann† have since shown that the anastomoses between the ophthalmic, orbital, and facial veins are so free that it is not at all probable that intracranial pressure can thus be transmitted through the veins to the eye-ground. Moreover, Michel‡ has recently shown (by autopsies of seven cases) that complete stoppage of the return blood by the vena centralis retinæ (by thrombosis) may occur, and, although giving rise to blindness and numerous hemorrhages in the retina, does not cause swelling of the intraocular end of the nerve.

II. *The vaso-motor theory.*—Benedict§ has attempted an ingenious explanation, to the effect that the engorgement and swelling of the disk are caused by a local palsy of the sympathetic; but it is scarcely possible that this palsy should be always limited to the few filaments supplying the intraocular end of the nerve, and that symptoms of paresis of the other branches—such as contraction of the pupil, partial ptosis, flushing

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* Lehrbuch der Ophthalmoscopie, Wien, 1868.

† Reichert's Archiv f. Anat. u. Physiol., 1869.

‡ Archiv f. Ophthalmologie, xxiv. 2.

§ Benedict, Electrotherapie, Wien, 1868.

of the face, which are notoriously absent in such cases—should not frequently occur.

III. *The lymph-space theory.*—Since Schwalbe, and Axel Key, and Retzius have added so much to our knowledge of the lymph channels of the cerebro-spinal system, and it has been known that the lymph spaces between the dural and pial sheaths of the optic nerves communicate freely with the corresponding lymph spaces in the cranium, the attention of physicians has been directed to the possibility of increased quantities of intracranial fluids (lymph, blood, pus) being forced into the space between the nerve-sheaths, and thus causing a dropsy of the peripheral end of the nerve, obstruction to its blood-circulation, and alterations in its nutrition.

According to this theory, owing to increased intracranial pressure, partial stasis occurs in the veins, with exudation of the watery parts of the blood into the sub-dural and sub-arachnoid cavities, and this fluid, seeking the point of least resistance, finds its way into the lymph space between the outer and inner sheaths of the optic nerves, and, by gradual pressure, causes a dilatation of the peripheral end of the dural sheath just before it passes into the sclerotic, compressing, at the same time, the pial sheath and the nerve-fibres covered by it. Moreover, experiments on animals show that increase of fluid in the sub-arachnoid space really acts in this way. Thus, Manz* has shown that two cubic centimetres of water, or water colored by Berlin blue, when injected into the sub-arachnoid cranial space of rabbits, causes a distention of the sub-vaginal space of the optic nerves, swelling of the optic disks, tortuosity and enlargement of the retinal veins, and, later, a diminution in the size of the arteries. Schmidt, in the calf, proved that such injections filled not only the sub-vaginal space, but also the lamina cribrosa, and distributed itself, to a limited extent, around the individual bundles of nerve-fibres.

In 1873 and 1874 I was much interested in this subject, and made several attempts to inject the sub-vaginal space of the optic nerves from the cranial cavity. The subjects on which I succeeded best were young children, in which I injected from the lower lateral corner of the anterior fontanelle. In several cases I not only succeeded in filling completely the sub-vaginal space, but also in partially filling the lamina cribrosa and the spaces around the smaller bundles of nerve-fibres. This injection of the spaces round the nerve-fibre bundles I found only at the peripheral end of the nerve. It appeared to enter the

* Archiv f. Ophthalmologie, xvi. 1.

lymph-sheath of the central vessels, and follow this in its ramifications between the bundles of nerve-fibres (for the central retinal artery and vein give off many branches to that portion of the nerve through which they pass). This distribution of lymph would also account for the great swelling of the distal end of the nerve in cases of choked disk. My injections filled also the lymph spaces of the spinal cord and of the nerves given off by it, and in a few, with high pressure, it penetrated from the sub-dural to the perichoroidal space.

I will now project upon the screen careful drawings from a case of choked disks, which came under my notice in 1873,* where the autopsy showed a sarcomatous tumor of the cerebellum, abundant serous fluid in the sub-arachnoid space of the brain and spinal cord, pear-shaped dilatation of the outer sheath of the optic nerve just before it passes into the sclerotic, and markedly swollen disks, which were commencing to undergo atrophy.

These pictures, which show, first, the cerebellar tumor; second, the dilatation of the outer sheath of the nerve; third, sections of the nerve and sheaths; and, fourth, the minute pathological alterations in it (varicose hypertrophy of the individual nerve-fibres, etc.), will probably give you a better idea of the pathological changes than any verbal description. I have since seen several other cases of brain-tumor in the practice of my medical friends, where the autopsies showed a like state of affairs, but none in which they were more marked or characteristic. It is worthy of note that the size of the tumor seems to have very little to do with the production of choked disk, and very large brain-tumors may exist without it, while very small ones may produce it. So long as absorption of normal tissue keeps pace with the development of the new growth we have no choked disk, but when this is not the case the growth acts as an irritant and foreign body, and here we are apt to find choking of the disks. Similar morbid alterations to those above described have been found, both before and since, in many cases of brain-tumor, by other observers, and, while I am far from asserting that this is the only way in which choked disk can be produced by intracranial disease, I do maintain that it is the only method of its production which has been at present demonstrated on the dissecting-table.

Local changes in the sub-vaginal space of the optic nerves may cause, either by direct pressure or by the development of local dropsy, an optic

* Transactions of the American Ophthalmological Society, 1874; Cases of Optic Neuritis, by W. F. Norris, M.D.

neuritis. Thus, Michel* gives a case where obstruction of the optic foramen and closure of the sub-vaginal space at this point caused a distention of the distal end of the nerve, by the proliferation of the delicate sub-vaginal tissue (arachnoid tissue); and the same author† has recently detailed a case caused by the development of tubercle in the distal end of the nerve. An enlargement of the sub-vaginal space at the distal end of the nerve is often caused by the shrinking of the nerve-tissue itself from atrophy, and might possibly, by a careless examiner, be mistaken for enlargement from pressure. [The lecturer here showed pictures of hemorrhage into the sub-vaginal space, of a myxo-fibroma causing a neuritis and dilatation of the sub-vaginal space, and also slides of the minute changes in atrophy and in peri- and interstitial neuritis.]

The doctrine above detailed is accepted by most ophthalmologists of the present day, Loring and Galezowski having been the most prominent opponents of it. The former‡ thought that observers were mistaken in speaking of the dilatation of the sub-vaginal space, and that the pear-shaped dilatation of the end of the nerve was caused by a splitting up of the layers of the dural sheath; and he doubted whether injections into the cranial cavity would really find their way between the sheaths and through the optic foramen. These, however, are mostly mere theoretical objections, and are substantially refuted by the above-detailed experiments and autopsies, and the single post-mortem examination which he adduces is not reported with sufficiently minute detail to prove the points claimed by him.

Galezowski,§ in 1872, at the International Ophthalmic Congress, stated that in fifteen autopsies of brain-tumor he had seen only one case of fluid between the sheaths,—an experience which must be regarded as exceptional, in the light of the numerous autopsies made with the opposite results by other observers; and it would be far more satisfactory to those who hold an opposite view if he had stated at what stage of the neuro-retinitis they were examined, and whether the ends of the nerves had been tied before removal, to insure any fluid which was present remaining *in situ*.

Moreover, the occasional occurrence of one-sided neuro-retinitis in cases of brain-tumor remains yet to be satisfactorily explained. I may mention in this connection that, in my injections of the sub-arachnoid

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* Michel, Archiv der Heilkunde, 1873.

† Michel, Deutsches Archiv f. Klinische Medicin, 1878.

‡ Amer. Jour. Med. Sci., 1875.

§ Report of Fourth Internat. Ophthalm. Congress, 1873.

cranial space, I have usually succeeded in filling the sub-vaginal space of the nerve on the opposite side of the head more completely than that on the same side. Whether this was purely the result of accident I cannot positively say; I know of no anatomical arrangement satisfactorily to account for it.

With this I close, in hopes that I have sufficiently interested my fellow-members in the subject to induce them to use their best efforts, by clinical observation and careful autopsies, to elucidate still further this interesting subject, and to help fill out the many gaps which still remain in our knowledge of it.

Dr. Risley said he felt not a little hesitancy in opening the discussion on this subject, important as it is both to the general practitioner and the ophthalmologist. He felt all the more hesitation since in the present state of our knowledge there was nothing to add to the lucid demonstration given by the lecturer, for which he desired to tender his personal thanks.

There were, however, many things regarding choked disk and optic neuritis in their relation to intracranial disease that to his mind were very obscure. In the first place, why choked disk should be more frequently associated—as is claimed by some observers—with tumors of the cerebellum than with new growths located elsewhere in the cranial cavity. Again, if it were true, as stated by the lecturer, that the amount of irritation seemed of more importance in the production of choked disk than the size of the tumor, why do we not with relative frequency find it associated with those forms of intracranial disease, as tubercular and other forms of meningitis, which cause the rapid pouring out of fluid into the ventricles and sub-arachnoid space? If, on the other hand, the increase of the cranial contents by the mass of the tumor or by the fluid in the ventricles and elsewhere were the essential factor in choked disk, why did it not occur with relative frequency in hydrocephalus, and in forms of meningeal inflammation in which the thickening of the tissues gave greater increase of bulk than would occur in moderately large tumors?

Dr. Da Costa said that he had listened with the deepest interest to Dr. Norris's comprehensive statements, and it was more in the desire of calling attention to some clinical points than in the hope of adding anything to what had been said that he addressed the Society. First, with reference to the view that diseases of the cerebellum invariably caused choking of the disk, he knew from cases that had come under his own observation that this was far from an invariable rule. In one instance in which the symptoms of cerebellar tumor were well defined, and a considerable tumor found at the autopsy, not the least evidence of disease

was found in the eye-ground, and the examination was made by the lecturer of the evening. In another case a similar negative result was obtained. There are, then, undoubtedly tumors of the cerebellum, as well as of the cerebrum, in which the growth does not occasion choking of the disk, and the question had presented itself to him, whether this happened in tumors of quite special regions of the brain. Should this be the case if the symptoms are present, we might be led to conclude on the exact locality of the growth from the absence of signs in the eye-ground, or at least this could be used as strong corroborative evidence.

On the whole, his experience had been very favorable to the use of the ophthalmoscope in the detection of organic brain lesions, especially of tumors, and he thought that no diagnosis should be made without it. Allowing for the exceptional instances referred to, choked disk is so common that we may lay the greatest stress on its not being found; and thus the negative evidence becomes immensely valuable in a great group of puzzling brain disorders of suspected organic origin yet without marked structural change.

Dr. Mills said that he had had the opportunity recently of making three post-mortem examinations in cases of cerebral tumor. Two of these tumors were situated in the anterior portion of the brain,—one in the frontal lobe and one in front of the optic chiasm; the third was a case of tumor of the pons Varolii. The tumor of the frontal lobe caused the most marked choking of the disks of both eyes that he had ever seen in any case; but, strange to say, the tumor located in front of the optic chiasm did not produce choked disk. Partial atrophy of the optic nerve of one eye was present, and the other eye could not be examined because of an opacity of the cornea. The tumor of the pons was unattended by choked disk.

In regard to cerebellar tumors, he agreed with Professor Da Costa. They certainly did not always cause choked disk; and he believed that they were most likely to bring about this condition when they were so situated as to cause bilateral pressure upon the venous channels. He had held an autopsy in one marked case of meningitis which showed no ophthalmoscopic changes during life.

The absence of ophthalmoscopic appearances of definite character in some cases of supposed disease of the cerebral convolutions is quite remarkable. He had been recently called by Dr. O'Hara to see a case in consultation, in which the patient was nearly blind in both eyes, and the other special senses and common sensation were all seriously affected. The case was supposed to be one of tumor or other lesion of the temporo-

sphenoidal lobe, but ophthalmoscopic examinations made by Dr. George C. Harlan revealed healthy eye-grounds.

Dr. Harlan said he knew of nothing to invalidate the opinion expressed positively by Hughlings-Jackson several years ago, that the condition of the disks does not afford the slightest reliable indication as to localization of the cerebral lesion, and that optic neuritis occurs from tumors in many parts, probably in any part, of the encephalon. As to the manner of causation of choked disk, none of the theories proposed seemed to him entirely satisfactory; certainly no one met all the cases that have been reported. He agreed with the lecturer, that the most nearly satisfactory was that which pointed to the sub-vaginal space as the channel by which the morbid action was communicated; but, unfortunately for its general acceptance, there were cases of choked disk, recorded by high authorities, in which the nerve between the ball and the brain was found perfectly normal. Perhaps it was a mistake to confine ourselves to one and the same cause for all cases. He thought that the variety of opinions held by careful and honest observers and profound thinkers of itself proved, either that we have missed the true cause altogether, or that the result may be produced by several causes.

As to the nature of the affection, he believed that the problem of descending neuritis was comparatively a simple one, as the inflammation had been traced anatomically from the brain to the eye; but that in typical choked disk we had a condition that was *sui generis*, quite distinct from any affection of the eye other than that resulting from cerebral causes. It differed objectively in the greater extent of the swelling of the disk and less involvement of the retina, and subjectively in less diminution of vision, which in some cases even remained perfect. Perhaps the nearest approach to the condition of the papilla in choked disk was found in albuminuric neuro-retinitis; but the vision was always seriously impaired in the latter. He thought it of interest, in this connection, that several cases of intracranial tumor had recently been reported in which the appearance of the eye-ground closely simulated that of albuminuric neuro-retinitis. He had himself seen one case in which the ophthalmoscopic picture of albuminuric neuro-retinitis was almost complete, but in which the very slight degree of diminution of vision led him to suspect an intracranial cause. The urine was found to be perfectly normal, but general symptoms were developed which pointed very decidedly to cerebral tumor.

Dr. Little said he thought the following cases would be of interest as bearing upon the subject:

In October, 1878, a young man, while gunning with a friend, was accidentally shot by him in the face, scalp, and right eye. They were both standing on a stone wall, thirty yards apart, guns loaded with No. 5 shot; a partridge flew between them, and his friend fired, the shot taking effect as above stated. He suffered only a stinging sensation and loss of sight, and had to be helped down from his position; he was treated by a physician, and in January, 1879, came under Dr. Little's observation.

One shot had gone through lobe of right ear; two shot were still present on right side of scalp; one about the median line in front; two more on left region of scalp. One shot had passed through right upper lid, through sclera of right eye, one-quarter of an inch from corneal junction, at upper and outer quadrant of right eye, on through choroid, retina, into vitreous, etc.; another shot was found at inner angle of left eyelid, but no shot in left eye.

Tension of right eye, —3; left eye, normal.

Perception of light in right eye, at the inner and upper part of eye. No perception of light in left eye.

Patient stated he was sure he had seen with both eyes before the accident; being ambidextrous, he could shoot to advantage aiming with either eye; had tested sight in other ways as well; saw none after the accident. Ophthalmoscopic examination revealed in right eye detachment of retina, general; sub-retinal effusion; loss of choroid at entrance of shot, scleral surface showing the sclera was depressed at seat of wound; got a reddish reflex only from inner and upper part of eye; seen best with a +6 (focal); opacity existing at inner and lower portion of eye; could see no shot in right eye, on account of the general disorganization on the exit of it. No iritis; no synechia; slight peripheral change in lens. Said at first there was a reddish tinge to what light perception he had, which, as blood became absorbed, changed to a bluish tinge. Electric current produced about natural symptoms. The left eye presented a true picture of atrophy; vessels small and tortuous; eye emmetropic. The nerve appeared as if it had undergone the change we expect to find after choked disk; no other condition present. Total loss of function; no response from electric current.

How to account for loss of sight in this eye became interesting and difficult. How to account for the choked disk that had evidently existed is of importance. The patient had exhibited no meningeal symptom; vision was immediately lost, and, not having had atrophy in the nerve prior to the accident, it appears evident that the shot which passed through the right eye must have passed through it and through the or-

bital wall of the right eye, on into the left orbit, and either cut the left optic nerve or been imbedded in or about it, or else one must have entered the left orbit and done the damage,—yet no scar could be found to make this clear. Sight was lost, then, by cutting of the nerve, and subsequently inflammation produced changes in intraocular end of nerve. It was not the result of meningitis.

Another case came to his mind that might be instructive, where there was total loss of function of one optic nerve and no sign of choked disk, and where he had every reason to believe a tumor, syphilitic in character, existed in the cranial cavity. He saw the patient for the first time yesterday, who gave the following history:

"Three weeks ago I observed I saw double, and that my upper lid drooped slightly; also my vision was a little indistinct in the right eye (the affected one). I also felt inclined to brush away from face on the right side what I supposed to be a hair rubbing my face,—in fact, the whole right side of face felt different from the left, and my hearing in right ear was not so acute as on left side. Gradually vision failed in right eye, when I consulted a physician, who referred me to an oculist."

On examination, Dr. Little found that thirteen years previously he had had the initial lesion of syphilis, which he had treated and healed himself. One month prior to his seeing double he suffered from a very severe neuralgia of right side of face and head; then the symptoms as above occurred. April 23d, found slight ptosis of right upper lid; divergent squint of right eye; hyperæsthesia of infraorbital nerve of right side; hearing of right ear (watch at four and a half inches); no cerumen in meatus.

Tension normal in right eye.

Perception of light faint in upper portion of retina, and towards inner and upper portion very faint.

Electric current produced no sensation of light.

Left eye normal, but ametropic; myopic astigmatism. Ophthalmoscope reveals only marked venous pulsation; edges of nerve slightly foggy (—24 focal clearest). No retinitis; no swelling of disk; no cupping.

This case presents total loss of function of nerve without choked disk, and yet showing an undoubted clinical history of a cerebral tumor.

These cases are interesting from their negative condition: in the one a choked disk occurring, with subsequent atrophy and no meningeal symptoms; the other, loss of function of the nerve, due to intracranial conditions, and no choked disk showing as yet. We do not know all

about the subject yet; cases are seen generally so late. This last case will be interesting to follow, and the former one only an autopsy can decide.

The lecturer of the evening has given a clear and unbiassed narration of the history of the subject, and made a beautiful exhibition of the anatomical conditions. Pathologically we must give preference to the theory he upholds,—that the sub-arachnoidal space is the source of communication between the brain and the intraocular end of the optic nerve.

Dr. Longstreth said that in 1876 he had occasion to make a collection of cases of tumors of the brain. The period included in his collection covered the years from 1865 to 1875, and embraced all the cases to be found in medical literature of all languages during these years, as well as a few unpublished cases from Norway, obtained through the kindness of the commissioner to the Centennial Exhibition from that country. It was intended to embrace in this a period, on the one hand, commencing with the use of the ophthalmoscope in the study of this disease, and, on the other hand, ending with the time when attention began to be directed to the localization of brain-function. Furthermore, it was intended to be a continuation of the work which Ladame had accomplished on this subject for the time antecedent to the year 1865. By those familiar with the subject, it will be seen that the first cases of prominence published during this period were those of Von Graefe, giving the results of his work on the connection between disease within the cranium and changes at the intraocular end of the optic nerve. The number of cases to which reference has been made, and whose clinical features were collected, gave a total of a few more than six hundred; none were here included in the list, nor was any reference made to such cases where the diagnosis had not been confirmed by an autopsy. During the year, or a little more time, while engaged in the work, Dr. Longstreth examined post mortem the bodies of six persons in which tumors of the brain were found. In all of his own cases, symptoms or changes in the optic nerve and retina were present during life, except in one case of multiple large tubercles, in which no ophthalmoscopic examination was made and no symptoms were manifested connected with the brain or with vision. It is possible that the symptoms in this case were masked and overlooked in the presence of the extreme exhaustion due to the chronic tubercular disease of the lung, from which the patient died. The case, however, formed no exception to the rule which held in the other cases, because an examination of the optic nerves, post mortem, showed marked alterations.

Of all this large number of cases the records of which had been exam-

ined, a very considerable number gave no account of the vision or of the results of an ophthalmoscopic examination; a still larger number furnished no account of the condition of the optic nerve and retina. Of the remainder, by far the larger portion, in which the record speaks of the condition of vision and its apparatus, very few indeed failed to show a deficiency in sight, or, by the ophthalmoscope, well-marked changes of the optic nerve and retina in one or other of the various stages and conditions resulting from intracranial pressure or from inflammatory changes of the brain and its membranes.

Dr. Longstreth was not able to state at the moment how small was the proportion of the cases in which an ophthalmoscopic examination had been made in which no changes were found in these organs when the post-mortem examination proved the existence of a brain-tumor or other disease capable of causing increased intracranial pressure. M. Reich (Russian), in the *Monatsbl. f. Augenheilk.*, 1874, states that, from an analysis of a moderately large number of cases, nearly all brain-tumors, in which a careful ophthalmic examination was made, the proportion was ninety-five in one hundred where optic changes were found. In Dr. Longstreth's very much larger collection, which included M. Reich's analyzed cases, the proportion was certainly not less than the figures mentioned.

It was to be noted that a few observers record the occurrence of appearances in the retina similar to the changes resulting in albuminic retinitis, although the reports show that no Bright's disease was indicated by the condition of the urine.

In regard to the changes in the outer sheath of the optic nerve, Dr. Longstreth had seen the ampullar dilatation well marked in some of the cases which he had examined post mortem, and in the records of his collected cases the condition was frequently noted. Dr. Longstreth had not found it necessary to ligature the optic nerve, previous to removal, to preserve the distended condition of the nerve-sheath. In none of his own cases had the distention been extreme, but in all of them, where the eyes had been examined, the condition was easily seen and well marked in the microscopic specimens.

The position of tumors, in reference to their capability of producing eye changes, did not, from a general survey of the collected cases, seem to be a point of much importance, and, apparently, no general law could be deduced concerning it. Tumors, in whatever position, seem equally capable of producing eye changes. It may be mentioned that small tumors, and, more rarely, also large growths, have occasioned optic-nerve

and retinal changes visible in one eye only. Perhaps a condition of more importance is the effect resulting from tumors situated below the tentorium or in close relation to its straight sinus. It is unquestioned that the pressure brought to bear on this important pathway of the returning blood from the lateral ventricles, or on the venæ Galeni, does cause a set of symptoms which become valuable as indicating a tumor seated in close connection with this membranous partition within the cranium. The prevention of the return of blood from the veins of the ventricle and the choroid plexus results in the accumulation of fluid within these cavities, and in this condition of a distended ventricle we have a cause, acting in addition to the intracranial pressure due to the tumor itself, which tends to produce stasis of blood or other changes in the optic nerve and retina.

Another consideration of importance, which deserves more attention than it has as yet received, is whether other cranial nerves, either sensory or motor, exhibit changes post mortem, or give rise to symptoms antemortem, of a similar character to those found in connection with the optic nerve and vision. The cranial nerves frequently suffer from the direct pressure of intracranial growths, but among the whole number of cases collected, or among a large number of papers consulted on this subject, one or two only furnish any allusion to anatomical changes, to symptoms due to increased intracranial pressure, or to neuritis produced by a tumor not directly in contact with a nerve-trunk other than the optic.

From the anatomical arrangement and openness to observation, as well as the careful study devoted to it, it is, of course, more likely that the changes in the optic nerve should have been discovered and discussed before similar alterations in other sensory or even motor nerves. While it may be true that the anatomical connection of the optic nerve with the brain and cranial cavity being such as it is, and quite peculiar to itself as distinguished from the other cranial nerves, alone subjects it to the changes which we know occur in this nerve from this cause, still it is not improbable that some, if not similar, alterations or symptoms may affect other nerves. One of the cases of this collection furnishing some evidence in support of this hypothesis was an instance of alteration in the sense of smell (subjective olfaction). The auditory nerve seems to be the one in which the next move in advance will most probably follow the discovery in connection with the changes of vision. The structure and function of this sense are the next best studied, and it is probable that some of the uses of the auditory nerve are at present unknown. The comparatively

recent statement that the semicircular canals of the ear have to do with the equilibration of the body seems to furnish a pathway of advance in the study of this hypothesis. The symptom of vertigo, so universally coming as the result of an intracranial growth, may be a phenomenon of similar import to some of the symptoms in relation to vision. Hasse has pointed out that the semicircular canals are connected with the cranial cavity by means of lymph-passages passing through the substance of the petrous bone. If, therefore, the intracranial pressure is increased, and does, as we know, propagate such pressure, by means of the optic-nerve sheaths, to the intraocular end of the optic nerve, it is not unlikely that pressure should be felt within the semicircular canals, and that similar symptoms should occur as in aural vertigo or Ménière's disease.

Dr. Shakespeare said that he could not endorse the sentiments enunciated in the opening of the debate concerning the relative frequency of choked disk in tumors of the cerebellum and the comparative infrequency of ocular trouble in hydrocephalus and tubercular meningitis. Neither his reading nor his personal observations permitted him to accept the opinion very widely entertained that the occurrence of choked disk is much oftener associated with tumors located beneath the tentorium than in other places. Careful analysis of reported cases has repeatedly shown that disturbance of the optic nerve in intracranial disease is far more common in lesions at the base of the brain than at any other point within the cavity of the cranium. Such investigations have very positively demonstrated the fact that nowhere is any morbid growth—a tumor or an inflammatory exudation—so likely to cause serious trouble somewhere in the course of the visual nerve as when it is located at the base of the brain in the middle fossa and near the median line. And this is what should be rationally expected, in view of what is known of the anatomy and of the pathology of this region. For it is just here—in the neighborhood of the cavernous sinus, of the optic foramen, of the optic nerves, the chiasm and optic tracts, etc.—that an exostosis, a thickening of the membranes, a comparatively localized meningitis, a small or a large morbid growth, can most certainly do mischief to the continuity of the optic nerves, or affect their blood or lymph circulation. Among several who, during the last decade, have studied large collections of cases, Allbutt and Annuske may be mentioned in support of these remarks. Of five or six cases of optic-nerve lesion associated with brain-tumor which had come under the observation of Dr. Shakespeare during the last two years, in all but two the tumor was seated at the base of the brain *in front* of the posterior fossa; and of the two exceptions, one was a tumor of the pia mater destroying a

small extent of the cerebral cortex of both the right anterior and posterior transverse parietal convolutions about midway in their course; the other was the case already referred to by Dr. Mills, where a large tumor was located in an anterior lobe. These two cases offered the most marked examples of choked disk he had ever seen.

Concerning the frequency of lesions of the optic nerve in cerebral affections, he thought that several considerations should induce us to give small weight to some objections which have been urged against the value and the significance of the presence or absence of evidence of disease at the intraocular end of the visual nerve in cranial disorders. In the first place, it is now well known that in œdema of the disk, in "stauungs-papilla," and even in neuritis and in the early stages of simple optic atrophy, vision is often not sufficiently affected to attract the attention either of the patient or physician; yet this fact has no doubt caused many cases of optic-nerve involvement to be entirely overlooked and excluded from the number which has furnished the percentage of optic-nerve lesions in the various forms of cerebral disorders. In the second place, there can be little doubt that, even where the ophthalmoscope has been used, many cases of eye lesion have been unrecognized or misconstrued. It is a patent fact that even experienced observers have confused choked disk with descending neuritis. Not infrequently the early stages or the slightly-developed forms of each of these two distinct affections have failed of recognition; especially is this likely to have been the case where the eye-ground has been examined by one not greatly skilled in the use of the ophthalmoscope,—an instrument which is even more difficult to master than is the microscope. Here, again, it is very probable that a large number of cases which would properly belong in the category of eye troubles dependent upon intracranial lesions have been excluded.

In making ophthalmoscopic examinations in these cases, the varying pictures of what has been called choked disk have not always been sufficiently appreciated. It has been very clearly demonstrated that the complete process known as choked disk, if it be allowed to pass from beginning to end, presents five distinct stages, each one of which affords an ophthalmoscopic picture different from the others, and which is more or less characteristic according to the activity of the special phase of the morbid process at work at the time of observation, whether it be œdema, engorgement, inflammatory exudation, partial atrophy, or complete atrophy. From examination of the fundus during the continuance of either the first or last stage alone it is extremely difficult, if not indeed impos-

sible, to say that there has been or will be developed a stauungs-papilla or choked disk. So, also, the ophthalmoscopic picture of descending neuritis may be considered as a shifting scene of at least four parts, each different from the others, and the two last sometimes so closely resembling the fourth and fifth stages of genuine choked disk as to make it nearly impossible by the eye to separate the one from the other. It is often difficult to discriminate between a simple degenerative atrophy of the optic disk and such atrophies as follow in the course of choked disk, descending neuritis, and other acute or subacute irritations of the nerve. In these varying pictures he found further reason to believe that a still larger number of cases of involvement of the nerve of vision had been excluded from the enumeration.

He could therefore readily accept the conclusions which Annuske had proclaimed at the end of his study of nine hundred and twenty cases,—viz., that neuritis (or choked disk) is an almost constant symptom in cerebral tumors, and that there ought to be assigned to it a value greater than that which has been accorded to it up to the present time.

Dr. Shakespeare also excepted to the intimation that in hydrocephalus and in tubercular meningitis choked disk and optic neuritis are infrequent occurrences. Several writers who have enjoyed abundant opportunities of studying the eyes in these affections, both in children and in adults, use most positive language expressive of their belief that at some time in the course of the trouble either choked disk or optic neuritis makes its appearance. Allbutt may be quoted in support of this opinion. Bouchut is still more dogmatic in his declarations on this point; and numerous other equally high authorities might be cited.

He admitted as possible the production of choked disk by the intervention of any one or more of the causes claimed by authors, but he thought that in the vast majority of cases the strangulation of the disk is caused by a damming up of the lymph in the subvaginal space of the optic nerve. He could not deny the force of the experiments and investigations of Schwalbe, Schmidt, Manz, *et al.* upon the lower animals. His own experiments, made in conjunction with Dr. Norris, upon still-born and older children, clearly demonstrated to him the existence in the human subject of a comparatively free communication between the lymph spaces surrounding the ocular end of the optic nerve and those of the sub-arachnoid of the brain. In the same connection, he thought that those cases reported of pachymeningitis hæmorrhagica, and of suppurative meningitis, in which, respectively, blood and pus had been found present in the sub-vaginal space of the optic nerve post mortem, offered

the strongest evidence in corroboration of experimental researches. He consequently saw no way to escape the conclusion that an increased amount of fluid at the base of the brain, or any other condition which would naturally interfere with the free voidance of lymph from the sub-vaginal space of the optic nerve, could very readily occasion an œdema of the optic disk and the development of a genuine "stauungs-papilla." He had been much interested in the remarks advanced, in the course of the debate, upon conditions of other nerves of the cranium analogous to that of the optic nerve. Concerning inflammation, it has already been sufficiently shown, by microscopic examination, that a descending neuritis, identical, histologically, with that which often attacks the optic nerves, may extend along any of the nerves which pass from the cranium at points where the conditions are favorable. Reasoning *a priori*, we would have every right to assume that an increased quantity of fluid in the sub-arachnoid spaces of the brain could cause an œdema of any nerve favorably situated with respect to the location of the fluid; and observations are not wanting in support of this rational assumption.

He desired to state a fact which would possibly throw some additional light upon the subject. While making his injections into the sub-arachnoid spaces of the brain, for the purpose of tracing the lymph connection between that organ and the eye, he had found, in several cases, that the injection also passed into the meninges of the spinal cord, from one end of it to the other, and also travelled along the course of each one of the spinal nerves as far as they were traced,—beyond the bony canal.

April 24th, 1879.

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3. *Orbital tumor removed by operation.*

Presented by Dr. John H. Packard.

Mrs. D., æt. 67, subject of a tumor in the upper part of the right orbit, crowding the eyeball downward and forward. It seemed to have been due to a severe labor in 1847. The sight of the eye seemed to be unaffected, except by the pressure changing the shape of the ball.

It was removed March 30th, by an incision parallel to and close below the eyebrow, enucleation being then easily accomplished with the fingers and knife-handle.

No untoward symptom followed. The eyeball was easily retained in its normal position, and moved in concert with its fellow. Six weeks

after the operation the deformity was very slight, and for her complete restoration she only needed proper glasses. *May 8th*, 1879.

Report of the Committee on Morbid Growths:

"The tumor presented by Dr. Packard, removed from the orbit, is found to consist, histologically, of a stroma composed of fibrillar connective tissue, the cells of which are, in many places, seen to be in an active state of proliferation. Traversing this stroma are observed transverse, oblique, and longitudinal sections of tubes possessing a lining of epithelial cells implanted upon a basement membrane. The blood-vessels are very distinct, having their walls increased in thickness by a development of fibrous tissue concentrically around them. Here and there through the section small cysts, containing a gelatinous tissue and lined with flattened cells, are seen. These cysts very probably are the result of a dilatation of the above-described tubes, their orifices having become obstructed and their cells undergone mucoid metamorphosis. This development and arrangement of elements would indicate the new formation to be a growth of a fibrous nature, in connection with glandular structure, —from its location, possibly the lachrymal gland. It may be designated as an intercanalicular fibroma, some of the canals dilated into small cysts."

May 22d, 1879.

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4. *Intraocular tumor growing from the ciliary region.*

Presented by Dr. John B. Roberts.

The patient, aged 33 years, says that ten years ago she felt pain and some impairment of vision in left eye, though she could read ordinary printing. This pain gradually increased, and the loss of vision became more marked. About six and a half years ago an oculist in a neighboring city advised enucleation on account of her having at that time severe pain, occurring in paroxysms. She states that at this time she could only see objects that were situated below the horizontal plane of her eye, while the field was lost in other directions. One or two months subsequently the eye became blind, except that a bright light could be distinguished, and for two years past she has had no vision whatever in this eye. The general condition of the patient has been good, though she has occasionally been troubled with cardiac palpitation. There is no cancerous family history, but many of her immediate relatives have been phthisical. She stated that for a couple of months the

pain in the eye had been severe, beginning to annoy her in the latter part of every second or third day. The severe pain began invariably in the afternoon, and lasted apparently during part of the night. She had been wearing for some years weak, convex, tinted spectacles.

On examination, the condition was found to be as follows:

There was no vision, no paralysis of motion, except perhaps a slight insufficiency of the internal rectus on converging the axes, and the conjunctival vessels on the nasal side were engorged and tortuous. The cornea was perfectly transparent; the pupil was elliptical in shape, with the long axis directed upward and rather outward; behind the iris, on the nasal side, was seen a black mass, which extended across the pupil three-quarters of the diameter, and pushed the inner portion of the iris forward almost, if not entirely, in contact with the cornea. The portion of iris in front of the tumor appeared to be thinned. The part of the pupil which was not occluded by the tumor was occupied by a white membrane looking like the capsule of the lens. The ophthalmoscope showed that it was not possible to illuminate the fundus. The tension of the ball was apparently diminished. The right eye was said to be somewhat painful at times, but there was no apparent failure of accommodation, and no external evidence of inflammation of iris or cornea.

The organ was enucleated by Dr. R. J. Levis, in the ordinary way, on April 15th, 1879, and placed in solution of chloral. Two days later I made a section of the globe, and found a soft growth, the size of a large hazel-nut, occupying the inner and anterior portion of the vitreous chamber. The vitreous humor was fluid and contained in the small space remaining outside and behind the tumor. The retina was opaque. The tumor had evidently arisen from the ciliary region, and was adherent to the whole circle of the ciliary body, so that the anterior portion of the eye was entirely shut off from the vitreous chamber. When the globe was turned inside out no point could be found where a probe could be passed alongside of the tumor into the anterior portion of the eye. The retina seemed to extend from the posterior part of the organ upon the surface of the tumor, as though the latter had pushed the retina up as it had been developed backward. Beneath this retinal investment the tumor was covered by pigment. Section of the cornea showed the lens to be pushed forward and externally by the growth; but it still remained behind the iris, and was not absorbed, as I supposed it to be when the eye was examined clinically. The position of the growth reveals the cause of the utter impossibility of illuminating the fundus, and the history would seem to show that the tumor had its beginning at the upper and nasal

part of the globe. There was no disease external to the globe, and the patient in a few days was able to return home. Doubtless in a short time she will wear an artificial eye.

Thus much for the clinical history and macroscopic appearances of the growth; as to the microscopic characteristics, I must refer the Society to my friend Dr. Longstreth, who has kindly made a number of sections for the members to examine this evening. The long period of development, the absence of active inflammatory symptoms, and the non-involvement of adjacent structures would lead to the diagnosis of an innocent tumor; and the location would suggest a myomatous growth, were it not that this form of intraocular tumor is exceedingly rare. Sarcomata are known to occur occasionally in this region as primary growths, but are usually secondary to a similar growth originating from the choroid; but then it is common to find accompanying inflammatory changes. The fact that no sympathetic trouble of the other eye had been produced by the growth of the tumor in the ciliary region is undoubtedly a point of some interest. *May 8th*, 1879.

Report of the Committee on Morbid Growths:

"A histological examination of the intraocular tumor presented by Dr. Roberts shows an alveolar arrangement, the walls consisting of fusiform and stellate cells, the latter containing granules of blackish pigment; within the spaces formed by this reticulum are seen round or oval lymphoid cells. The blood-vessels are found to possess embryonic walls, and many are congested with blood. The new formation is an alveolar sarcoma, the stroma of which contains many pigmented stellate cells."

May 22d, 1879.

VIII.—TUMORS NOT OTHERWISE CLASSIFIABLE.

1. *Neuralgic tumor of the skin.*

Presented by Dr. H. Lenox Hodge.

The tumor which I present to the Society to-night was removed last April from the forearm of a man about 48 years of age. There has been no return of the growth, and the patient has been entirely free from all pain.

The tumor was rounded, and measured six-eighths of an inch in diameter at its base, and in height five-eighths. It was of a bluish color, and was extremely sensitive. The painful character of the tumor was its most remarkable characteristic. Even the rubbing of the patient's shirt upon the tumor was very painful. A slight pressure upon it would cause him to faint.

He first noticed it sixteen or seventeen years ago, on the outer side of his right forearm near the olecranon. It was then a small nodule like a bead, and not at all painful. About seven years ago the pain began, and has been steadily on the increase, until life became a burden and he was filled with a constant terror lest the tumor should be touched or pressed upon.

During all these years the growth has increased very slowly in size. It contracted no adhesions to the deeper tissues, but remained perfectly movable.

This colored drawing which I exhibit has been carefully made by my friend Dr. Taylor, Resident Physician of the Children's Hospital. It accurately represents the appearance, color, size, and situation of the tumor.

Dr. Seiler has kindly made the microscopical examination, and has placed a beautifully-stained section beneath the microscope for examination by the members of the Society. His description of its structure states "that it presents on section a network of well-developed connective tissue, the meshes of which are irregular as to size and shape, and are filled with both red and white blood-corpuscles. The dermis and epider-

mis covering the tumor appear atrophied, while the growth itself resembles the corpus cavernosum of the penis."

The tumor, as the section shows, extends below the surface of the skin, and it appears probable that it arose in the connective tissue and gradually trespassed upon the skin. Notwithstanding its painful character, no connection with any nerve-fibre has been detected. By its growth it has probably pressed upon the minute nerve-filaments in the skin, and thus given rise to the intense neuralgic pain.

September 12*th*, 1878.

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2. *Primary cancer of the intra-thoracic glands.*

By Dr. William Pepper.

The patient, a blacksmith, æt. 40, was admitted to the Philadelphia Hospital suffering with large pleural effusion on left side, extreme dyspnœa, husky whispering voice, and slight dysphagia. The history was obscure. It appeared that for two years there had been occasional dysphagia and increasing huskiness of voice. For the past three months there had been increasing dyspnœa. On careful examination, the physical signs of pressure on right bronchus were detected, and some hard and enlarged lymphatic glands were found in left supraclavicular space.

The diagnosis was made of primary cancer of intra-thoracic glands, pressing on right bronchus, œsophagus, trachea, and azygos vein. Death occurred suddenly from syncope.

The *autopsy* revealed cancerous disease of the glands in both anterior and posterior mediastinum, forming masses of considerable size. The right bronchus was compressed. The œsophagus and descending thoracic aorta were partly imbedded in the cancerous growth. The azygos and hemiazygos veins were involved, and so imbedded that it was impossible to dissect them out. Large pleural effusion existed in the left side.

October 24*th*, 1878.

Report of the Committee on Morbid Growths:

"The specimen of intra-thoracic new formation presented by Dr. Pepper, and referred to the Committee on Morbid Growths, is found, by microscopic examination, to consist of a fibrous tissue stroma arranged so as to form alveolar spaces, in which spaces are seen epithelial cells. This arrangement of structure is characteristic of carcinoma—variety

scirrhus. The enlarged glands from the neck have undergone a similar metamorphosis, as shown by microscopic examination."

November 14*th*, 1878.

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3. *Tumor of abdomen.*

Presented by Dr. James E. Garretson.

This specimen was taken from a tumor situated at the umbilicus of a lady who died at 51 years of age. She weighed two hundred and twenty pounds, and was about five feet five inches in height.

Nineteen years previous to her death, an umbilical hernia, about five or six inches in diameter, made its appearance. She wore a truss, and one of the supports passed over the lower part of the liver.

She gave birth to five children before the appearance of the hernia, and to five afterwards, the last seven years ago.

About a year since, pains commenced in the region of the liver, stomach, and umbilicus. Last June the pains became very severe, and soon after she was taken to her bed.

She had no fever during her illness, from last May until the week before her death. Her bowels were moved only after the use of an enema.

The fæces were whitish and soft; the urine was highly colored and ropy; her body at times was very yellow; she had no vomiting.

Six hours before her death, she had a discharge from her mouth, resembling broken-down blood.

The tumor formed and became hard in the place of the hernia, about six weeks before death. *November* 14*th*, 1878.

Report of the Committee on Morbid Growths:

"A microscopical examination of the specimen presented by Dr. Garretson exhibits the elements and arrangement of a carcinoma, variety scirrhus,—viz., groups of epithelial cells in alveolar spaces; the fibrillar connective tissue constituting the walls of the alveoli is considerable in amount." *December* 12*th*, 1878.

4. *Abdominal tumor from a child æt.* 13 *months.*

Presented by Dr. Joseph V. Kelly.

E. S., æt. 13 months, was perfectly healthy from birth until nine months old, when the abdominal tumor was accidentally discovered by the mother. I saw the child within a few days after this discovery, and at that time the tumor occupied half of the space of the abdomen, the largest bulk being on the left of the median line. The little patient suffered, apparently, but little from pain, and there was no vomiting or diarrhœa. Previous to death, the abdominal veins were distended and a moderate amount of effusion was detected. At the *post-mortem* the tumor seemed to spring from the omentum and intestines, and was with great difficulty enucleated from the abdominal viscera, excepting the liver and spleen, which were apparently healthy. There is no history of cancer in either the father's or the mother's people.

December 12*th*, 1878.

Report of the Committee on Morbid Growths:

"A histological examination of the abdominal tumor presented by Dr. Kelly demonstrates the new formation to belong to the typical class of growths, consisting of a single tissue, having its prototype in the physiological striated muscular tissue. It is composed of long narrow fibres measuring the one three-thousandth of an inch in width, many of which present a transverse striation seen with a power of 500 diameters; upon the fibres are found numerous oval nuclei. The arrangement of the fibres is in bundles, which run in every direction. The new formation may be classified as a myoma, variety rhabdo."

December 26*th*, 1878.

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5. *Sarcoma of the neck.*

Presented by Dr. Carl Seiler.

Eliza B., æt. 65, presented herself at the Dispensary for Throat Diseases at the University Hospital on the 21st of January, 1878. She complained of difficulty of deglutition and a swelling in the anterior region of the neck. By questioning her it was found that she had a slight cough, with yellowish expectoration, but no hoarseness or soreness of the throat. The swelling in the neck, she said, had made its first appear-

ance about six months previous, as a small hard lump in the right side of the neck, and had been growing ever since. The difficulty of deglutition had, however, been noticed only a few weeks ago, and was growing daily worse.

On examination, it was found that a hard tumor was situated in the anterior region of the neck, reaching from the hyoid bone down to within a half-inch of the right clavicle. It was but slightly movable, and appeared divided into two unequal parts by a longitudinal depression corresponding with the isthmus of the thyroid gland. On palpation, the tumor felt hard and nodulated.

A laryngoscopic examination revealed the epiglottis to be so pendent as to obscure all view of the laryngeal cavity. On raising it by means of the epiglottic forceps, it was found that the lateral diameter of the larynx was very much elongated; the mucous membrane presented a healthy appearance.

As an operation for the removal of the growth—which was supposed to be a scirrhus of the thyroid—was deemed inadmissible, tincture of iodine was injected into the tumor, with the result of reducing it somewhat. The neck at first measured around the point of greatest swelling sixteen and one-half inches, while a few days after the injection it measured at the same point but sixteen inches.

The difficulty of deglutition, however, steadily increased, until the patient was unable to swallow anything, and was kept alive by nutritious enemata. The cough increased, also difficulty of breathing, and the expectoration became brownish. Owing to the feeble state of the patient, a physical examination of the lungs, as well as an exploration of the œsophagus, was not made. She died on the 12th of February of the same year, about three weeks after I first saw her.

At the *post-mortem* examination, at which Dr. Curtin kindly assisted me, the body was found emaciated, but not as much so as might have been expected.

The abdominal viscera were found to be normal. The lungs were congested, presenting a few calcareous nodules. In the neck was found a large tumor, of firm consistence and of about the size of two fists, involving the trachea, larynx, œsophagus, and the internal carotid artery on the right side.

On microscopic examination, this tumor proved to be a spindle-cell sarcoma, containing giant cells. *December 12th*, 1878.

6. *Tumor of hand.*

Presented by Dr. John H. Packard.

Mrs. Y., æt. 41, was seen by me at the request of Dr. Isaac W. Hughes, December 13th, 1878, on account of a tumor of the right hand. She had, about a year previously, strained the middle finger in pushing some clothes into a basket; it remained painful and stiff, and five months later she noticed the swelling, which steadily increased from that time.

The tumor was about the size of a small orange, decidedly lobulated, a small mass projecting into the palm nearly at its centre. The skin covering it was of a purplish-red color, smooth and shining, looking as if it was very tense; but there was a feeling of fluctuation on pressure. Sometimes there was a great deal of pain in the growth, shooting up the arm. There were no enlarged lymphatic glands.

Her general health was excellent, and her appearance that of robust health. So far as she knew, her family history was good.

December 16th, in presence of Drs. Hughes, Sr. and Jr., and Dr. I. P. Stidham, I punctured the tumor with a grooved needle, the patient having been previously etherized; only a little blood escaped. I therefore proceeded at once to amputate just above the wrist by Teale's method slightly modified. Carbolized gut ligatures were applied, a small drainage-tube placed between the flaps, and the wound dressed with carbolized cerate.

She has had no bad symptoms, and the healing is now (December 27th) almost complete.

The tumor on section shows a capsule, enclosing a soft, brain-like substance, lobulated, some of the nodules being much more vascular than others. On hasty examination under the microscope it seemed to me to be a round-celled sarcoma.

As the knife penetrated the deeper portions of the mass, it encountered a spiculum of bone, probably a portion of the metacarpal of the middle finger.

The specimen was referred to the Committee on Morbid Growths.

December 26th, 1878.

Report of the Committee on Morbid Growths:

"The tumor of the hand, presented by Dr. Packard, is found to consist of round lymphoid cells, without any apparent intercellular sub-

stances. The vessels are seen to be channels through the cells, possessing no distinct walls.

"The growth is a round-cell sarcoma." *January 9th*, 1879.

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7. *Erectile tumor from scalp.*

Presented by Dr. C. Seiler.

The tumor, of which a microscopical specimen is under the microscope, was removed from the scalp of a young girl by Dr. S. W. Gross; it projected about an inch and a half from the surface of the scalp, being somewhat thicker at the free end, and pointed, resembling in shape a penis. The free end was ulcerating and emitted an extremely offensive odor. The growth had first been noticed six months previous to the operation.

On making a longitudinal section through the tumor, and after staining it with carmine and indigo, it was found, on microscopical examination, to present a picture very similar to that of a longitudinal section of a small penis.

The base was found to be composed of the normal tissue of the scalp, the shank or narrow portion of cavernous or erectile tissue, the meshes of which were lined with endothelium and filled with blood-corpuscles, while the gland-like expansion at the free end showed, at first glance, glandular tissue. A more careful examination, however, proved this tissue to be the same as that of the shank, but with the endothelial cells of the caverns in an active state of proliferation and a return to the fœtal state. The whole of the tumor was covered with a thin layer of epithelium, except at the extreme end, where it had been destroyed by ulceration. By the ordinary processes of staining with one color, the distinction between glandular tissue, and this cavernous tissue, filled with proliferating cells, could not easily have been made; but by employing the double staining, which colors the nuclei red, while the intercellular substance is tinged blue, and the blood-corpuscles green, it was readily seen that in between the oval cells numerous green blood-corpuscles were impacted.

I have presented this specimen because it shows the value of large sections, and of the double staining process in pathological histology; for, if a transverse instead of a longitudinal section had been made, the true nature of this growth could not have been made out without great trouble. *February 13th*, 1879.

8. *Acute miliary tuberculosis.*

Presented by Dr. Morris J. Lewis.

Jane McD., æt. 4 months, the patient, was brought to the Children's Hospital, for the first time, January 29th, 1879, suffering apparently from indigestion. The child was bottle-fed, and had been ailing since ten days old, the principal symptom being colic. Dr. Starr, who saw her first, treated her accordingly, as there was nothing to call attention to any more serious trouble.

Three days later I saw her for the first time. She was then brought back to the hospital with slight cough, which had developed in the interval. Examination revealed bronchial râles, large and small, over both lungs, anteriorly and posteriorly, and but slight, if any, change in percussion-note. She was placed upon the ordinary cough-mixture of the hospital, and the mother told to return if the child became worse. Six days later, February 7th, she was brought back, with a short, hard, paroxysmal cough, which occurred at intervals of every few minutes, and which evidently caused pain, as the child cried with each paroxysm. The respiration was hurried, and examination revealed considerable impairment of resonance over right lung posteriorly, with increased tussive fremitus. Auscultation revealed slight bronchial breathing on right side, and moist râles with both acts of respiration. The left lung was the same as at last visit, except that slight impairment of resonance was detected. After this I attended the child at its home, where the following history was obtained. The child's grandmother and maternal aunt died of consumption; the mother has considered herself delicate for some years, and has had winter cough, and muco-purulent expectoration. Examination revealed a small vomica at right apex posteriorly, and crackling anteriorly. The father is a healthy man, and his family history good.

The patient was the first child, and, as the mother was unable to nurse her after the tenth day, she was fed from the bottle. The parents considered the child moderately healthy, with the exception of frequent attacks of colic, which were attributed to the manner of feeding. She had never had convulsions, and her bowels had been moderately regular.

The child was pale and thin, with a moderately protuberant belly. The respiration was hurried, being 60 per minute, and mainly diaphragmatic, the movements of the chest being slight, and principally those of

elevation, and not of expansion, the left side moving more than the right. The pulse was regular and rapid, averaging 160 per minute. Examination showed dulness over right lung from apex to base posteriorly, while anteriorly it was not so marked. Over left lung there was but slight impairment of resonance, either anteriorly or posteriorly. Auscultation revealed blowing respiration, with a few bronchial râles, and no crackling over right lung, and exaggerated breathing over left lung, with bronchial râles. Examination was made under considerable difficulties, as the child coughed incessantly when raised from the bed, and cried when moved; the only position in which she could rest at all was upon the right side. The child's appetite was capricious, some days refusing nourishment, and again taking it with avidity.

After this the symptoms gradually became more severe, and two days before death Dr. Hopkins saw the case with me. The movements of the right chest had then almost ceased, and the lower ribs bulged slightly, while upon the left side the movements had somewhat improved. Auscultation revealed coarse crackling râles over roots of both lungs, with absolute dulness on percussion on right side. Cyanosis had made its appearance, the nails, knuckles, and forehead being very dark, and the child was in a profuse perspiration. Both eyes were turned upwards and to the left. The next day she had a slight convulsion, which was not general, and lasted a few minutes only. The following day she died, February 18th, 1879. During the attack the pulse remained about 160, and the respiration 60 per minute. The temperature varied from 101° F. to 102½° F.

The *autopsy* was made twenty-two hours after death, with the assistance of Dr. Starr:

Decomposition commencing in abdomen. Child thin and emaciated. Head normal in size and shape; ribs bulged slightly towards lower part of chest, and there was slight beading of their anterior extremities, but no enlargement of lower end of radii. Pleural cavities contained no abnormal amount of fluid; some few adhesions, not firm, existed upon right side posteriorly, none on left. Mediastinal glands enlarged. Right lung hepatized and non-crepitant, sinking in water, its pleura studded with numerous miliary tubercles about the size of a grain of sand. Upon section, numerous cheesy deposits were seen. Towards lower part of upper lobe, posteriorly, a cavity was found, measuring about three-quarters of an inch by an inch, and filled with broken-down cheesy material. Left lung but slightly congested, floating in water, its surface covered with distended vesicles, particularly over upper lobe, and studded

with tubercles. At lower part of upper lobe a cavity smaller than that on the right side was found. On section, some few cheesy deposits. No tubercles could be detected on costal pleura. Pericardium contained a small amount of serum. Heart firm and apparently normal. No tubercles seen. Liver somewhat large, free from adhesions, and studded with miliary tubercles upon both its upper and lower surfaces, varying in size from a grain of sand to a head of a pin. Spleen large, adherent over small area by fresh lymph to abdominal wall, and studded with tubercles, some of which were as large as half a grain of rice. Kidneys apparently healthy. Intestines studded here and there with solitary tubercles, especially over ileum, and one or two small ulcers were detected, having the position of Peyer's patches. Mesenteric glands enlarged. No tubercles discovered on parietal peritoneum. Unfortunately, no examination of the head was allowed. *February 27th*, 1879.

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9. *Myxo-sarcoma of inferior maxilla.*

Presented by Dr. M. Longstreth.

B. F. M., æt. 25, married, miner. Admitted to the Pennsylvania Hospital, January 7th, 1879, under the care of Dr. R. J. Levis; discharged, well, January 24th, 1879. His family and personal history were good. About eighteen months previous to admission he was kicked on the right side of the face by a mule. Shortly afterwards he noticed a small "white blister" on the gum of the outer side of the lower jaw. Subsequently an ulcer formed at this place, increased in size, and became painful. Later, the bone began to enlarge beneath the seat of the ulcer. Nine months before his admission to the hospital, the bone was scraped to remove the growth.

On admission, there was found a tumor growing from the inferior maxilla on its right side. It was moderately firm and resistant, and was covered by abundant granulations.

On January 8th, Dr. Levis excised the portion of the bone involved in the growth. The specimen measures two and a half inches in length. The tumor springs upward from the alveolar process of the bone in a fungus-mushroom manner, and projects also from the outer aspect of the jaw. On the inner surface of the bone the normal outline is preserved, but the periosteum is thickened and the bone is thinned to a mere shell, which gives little resistance to pressure. The tumor appears to have

started from the sockets of the teeth, and has grown upwards above the level of the alveolar process about one inch; on the outer surface of the jaw it also projects an inch, and is there covered, in parts, by a very thin layer of bone and by the periosteum.

At the posterior part of the specimen the last molar tooth remains in position, with the tumor springing up around it. At both ends of the specimen the bone and the periosteum covering it appear normal. Forward from the molar tooth the alveolar process has been destroyed. The consistence of the tumor is firm and markedly elastic; its upper surface and borders are covered by mucous membrane, except at several points along the dental line, where ulceration has occurred.

On section, the whole substance of the growth is seen to be made up of a whitish-yellow, semi-transparent, gelatinoid-looking tissue; but its consistence is, however, pretty firm, and there are seen bands of fibrous tissue, extending inward through its substance, at intervals, from the periosteum covering the tumor. There exudes a moderately thick, gluey fluid from the surface of the section, which can be drawn out in strings by the fingers.

Immediately after the operation microscopic sections (three-quarters of an inch by one-half inch) were made of the tumor, taken from the part projecting upward, and including its mucous membrane covering.

The examination of them shows the mucous membrane thinner than normal, and the papillæ to a great extent smoothed out by stretching of its tissue over the growing tumor. In parts the thickly-laminated epithelial layer of flattened cells is preserved; in others it is completely removed, leaving only the deeper (spinous or furrowed) cells,—those directly in contact with the basement membrane. The submucous tissue shows its fibrous and elastic trabeculæ considerably thickened and its interspaces filled, more or less completely, with small round cells, generally closely aggregated. The vascular supply of this part appears considerably increased, the arterial walls thickened, and an especial tendency for the cellular aggregations to occur around the vessels is visible.

From the inner surface of the submucous tissue many fibrous bands are seen penetrating the proper tissue of the tumor beneath it, thus confirming the naked-eye appearance previously noted. In the area of the tumor itself the sections show, in the first place, bands or tracts of spindle cells, closely laid together, and having the usual appearances, in respect to size, outline, nucleus, etc., of the cells found in the small spindle-cell sarcomata. The bands pursue different directions; some are seen cut

parallel to the long axis of the spindle cells, some transversely, and others are divided at various angles of inclination.

Secondly are seen cells having the same figure as the others, which, instead of being closely laid together, are separated by clear spaces having frequently a width equal to several times the diameter of the nuclei of the cells. These cells, taken in groups, have their long axes generally placed in the same direction; but not invariably so, for occasionally a cell is seen laid transversely to the general direction. The cells are not parallel to each other; their tapering processes are contorted and intertwined, and often lie across the body of other cells. The nuclei of these cells were relatively large in proportion to the cell body, and they contained large granular nucleoli. At these parts of the specimen the cells appeared as though disrupted and disturbed from their former positions by an expanding force acting within the tumor. The clear spaces between the cells appeared to be made up of finely fibrillar tissue, occasionally very finely granular, and at some parts containing small granular cells similar to those seen in the submucous connective tissue.

Thirdly, there were areas of the specimen showing cells, many of which resemble those last described; other cells were stellate, or multipolar, or with only one pole branched. In these portions of the specimen the cells were much more widely separated than in the preceding portion, and the cells did not seem to have any definite arrangement. The intercellular spaces or substance appeared entirely structureless, without fibrillæ or granules. Besides the multipolar cells and the few spindle cells seen in these parts, there were quite numerous large, and a few small, granular cells; in some of them can be seen large, distinctly-outlined nuclei, containing many granules, and occasionally a highly refractive granule or oil-globule. There were also seen here granular masses, having no distinct limiting membrane or any definite shape, containing one, two, or three cells or nuclei similar to those just described.

The vascularity of the tumor proper is scanty, except at its periphery, and directly beneath the mucous membrane no large vessels are visible. The fibrous bands penetrating the tumor from the submucous tissue nearly all carry small arterioles, but their vascular areas, like the fibrous bands, do not penetrate deeply. On the contrary, the arterial supply to the growth seems to be of central or bone origin. The vessels of largest calibre are of more common occurrence in the deeper parts; very few of these vessels can be described as arterioles, for their structure resembles that of capillaries, although of very wide lumen. A few only have fibrous sheaths, and in these instances the spindle cells are laid parallel to their

course; the majority present the appearance of nucleated tubular structures, generally deeply stained with carmine.

The conclusion to be drawn from the microscopic structure is that the growth—originally a small spindle-cell sarcoma, and still preserving, in nearly every part, cells which, in contour and arrangement, are typical of such a tumor—has undergone myxomatous degeneration.

May 8th, 1879.

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10. *Myeloid sarcoma of jaw.*

Presented by Dr. M. Longstreth.

Sarah R., æt. 30, married; admitted to the Pennsylvania Hospital, under the care of Dr. R. J. Levis, on March 14, 1879. Her family and personal history offered no peculiarities. Two years previous to her admission, and shortly after the extraction of two molar teeth from the left side of the lower jaw, she noticed a slight swelling and ulceration of the gum around the sockets of the removed teeth. A month later a small piece of bone (alveolar process) came away, and after a month's time the place healed. Some time after this she noticed a small swelling, which was not sensitive or painful to touch, but very vascular, bleeding on the slightest pressure. Frequently, on waking in the morning, she found her mouth "full of blood." About a year ago a part of the tumor was removed; about six months ago an unpleasant odor was first noticed from the disease.

Upon admission, a tumor was found growing on the left side of the inferior maxilla, at the part corresponding to the site of the extracted teeth. It was covered by vascular granulations, which bled very easily on handling. The odor from the mouth was very offensive. On March 26th, Dr. Levis excised this part of the bone; the incision, anteriorly, passed just in front of the first bicuspid tooth; posteriorly, at the angle of the jaw.

The specimen showed the lower half of the body of the jaw, at the seat of growth, entirely unchanged and not affected with disease; the periosteum covering it was normal. The tumor arose as a fungous mass from the alveolar border, and about half an inch above the level of this border of the bone. The breadth of the tumor, transversely to the jaw, measured two inches; its extension along the bone was about the same. The growth seemed to have sprung from the sockets of the teeth, and was extending around the remaining bicuspid tooth. The alveolar pro-

cess has disappeared; the periosteum around the base of the tumor was much thickened, but there were no spiculæ or plates of bone to be found in it or on the surface of the tumor. The upper surface of the growth was broad, flattened, and ulcerated, and denuded of the mucous membrane; whilst laterally this structure covered the growth. The consistence of the tumor was very firm; on section, its appearance was nearly uniform throughout, of a reddish, flesh-like color.

A microscopic examination of the tumor showed the structure to be that of myeloid or giant-cell sarcoma. The only peculiarity to be noticed was that the myeloid masses or giant cells were of small size.

May 8th, 1879.

IX.—MISCELLANEOUS.

Mechanical microtome.

Presented by Dr. C. Seiler.

I exhibit to the members to-night a mechanical microtome of novel construction, which I designed for the purpose of making large, thin, and even sections of hardened tissues. A mechanical microtome in which the knife is held rigidly by moving parts of the instrument itself has been a desideratum for a long time, and many workers have designed and constructed such contrivances; but all of them started with the erroneous idea that a slide upon which the knife is fastened, and which runs at an acute angle to the tissue imbedded, would carry the knife through the tissue by a sliding motion, such as is produced by the hand alone making the section. This, however, is not so, and by means of such a slide the knife acts like a carpenter's plane, pushing through the tissue like a chisel instead of cutting like a knife.

By analyzing the motion of the arms in making thin sections I came to the conclusion that if the knife was attached to two arms, which are allowed to rotate upon fixed pivots attached to the section-cutter, the knife would pass through the tissue, each point of the cutting edge describing a curve whose radius is the two arms carrying the knife. The principle is identical with the one upon which the parallel ruler is constructed, one blade of which being fixed allows the other to move to and fro in the same manner as the knife in this case moves.

After constructing a rough model of the apparatus, I asked my friend Mr. T. Zentmayer to construct the instrument. In doing so he added many improvements in the motion, and in the adjustment for different inclinations of the knife, which insure a perfect working of the instrument even in the hands of unskilled persons.

The specimens cut with this machine, which I have brought to show what can be accomplished in the way of large and thin sections, are: a longitudinal section of the leg of a five-months fœtus from the knee downward, measuring two inches in length and three-quarters of an inch in

width at the widest part; a section of an epithelioma from the cheek, one-half by three-quarters of an inch; and a longitudinal section through the upper and lower maxilla of a five-months' fœtus, taking in the turbinated bone, measuring one and one-half by one and one-quarter inches.

It is needless to point out the great advantage of large sections, especially of pathological tissues, and I have no doubt that when this instrument becomes generally used we will have more and bettter microscopical examinations of tissues than at present, since many who would gladly work with the microscope are deterred from it by the difficulty of making thin sections. *September* 12*th*, 1878.

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